PRINTRONIX®

Setup Guide

The Printronix P5000 series with DEC LG Emulation

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Use of the term "LG Emulation" is to indicate compatibility with products from Digital Equipment Corporation. No claim of affiliation with Digital Equipment Corporation or Compaq Computer Corporation is made.

Table of Contents

1 *Overview*

About This Guide

This *Setup Guide* is designed so you can quickly find the information you need to install and configure your Printronix DEC LG Emulation printer.

Warnings and Special Information

Read and comply with all information highlighted under special headings:

WARNING **Conditions that could harm you as well as damage the equipment.**

CAUTION **Conditions that could damage the printer or related equipment.**

IMPORTANT **Information vital to proper operation of the printer.**

NOTE: Information affecting printer operation.

Printing Conventions in This Guide

UPPERCASE print indicates control panel keys.
Example: Press the CLEAR key, then press the ON LINE key.

Quotation marks (" ") indicate messages on the Liquid Crystal Display (LCD).
Example: Press the ON LINE key. "OFFLINE" appears on the LCD.

The **+** (plus) symbol represents key combinations.
Example: "Press = + >" means press the = (UP) key and the > (DOWN) key at the same time.

Related Documents

Following is a list of related documentation:

- *The Printronix P5000 series of Line Matrix Printers with DEC LG Emulation Maintenance Manual*
Explains how to maintain and repair the DEC LG Emulation line matrix printer at the field service level of maintenance. This manual covers alignments and adjustments, preventive and corrective maintenance, troubleshooting, and basic principles of operation. The *Maintenance Manual* is not provided with the printer, it must be ordered separately.

- *The Printronix P5000 series of Line Matrix Printers with DEC LG Operator's Guide*
  Describes the keys on the control panel and provides quick reference information on daily printer operations such as loading paper and replacing ribbons. This manual is provided with every printer, and is available in five languages: English, French, German, Italian and Spanish.

- *DEC LG Emulation LinePrinter Plus Programmer's Reference Manual*
  Covers the host control codes and character sets for the LinePrinter Plus® emulations.

- *DEC LG Emulation LG Programmer's Reference Manual*
  Explains the host control codes and character set for the Digital® LG emulation.

- *DEC LG Emulation IGP/PGL Programmer's Reference Manual*
  Provides information used with the optional IGP®/PGL® Printronix® emulation enhancement feature. The IGP/PGL emulation allows you to create and store forms; generate logos, bar codes, and expanded characters; create other graphics, and merge graphics with alphanumeric data as a document is printed.

- *DEC LG Emulation IGP/VGL Programmer's Reference Manual*
  Provides information used with the optional Code V™ emulation enhancement feature. The Code V emulation allows you to create and store forms; generate logos, bar codes, and expanded characters; create other graphics, and merge graphics with alphanumeric data as a document is printed.

The P5000 series with DEC LG Emulation Printer Family

The DEC LG Emulation printers are a family of line matrix printers consisting of 500, 1000, and 1500 line per minute (lpm) models packaged in various configurations. All of the models offer software versatility and the latest refinements in line matrix printing technology. The model numbers indicate printing speed and physical configuration:

Table 1. The DEC LG Emulation

Model Number	Print Speed	Pedestal	Cabinet
P5005	500 lpm	✓	
P5205	500 lpm		✓
P5010	1000 lpm	✓	
P5210	1000 lpm		✓
P5215	1500 lpm		✓

Most line matrix printers have specialized architectures, which enable the printer to emulate, or behave like, another printer. These specialized architectures are restricted. Your printer, however, introduces an open architecture concept that is not available on any other line matrix printer.

Your printer is very easy to use. The message display and lights on the control panel communicate with you directly and clearly. You can select every function on your printer at the control panel, or you can send commands from the host computer.

The printer has a feature called Flash memory, which allows you to download programs from a diskette to your printer. Flash memory provides "instant" booting of the printer. The absence of Read Only Memory (ROM) and the flexibility of Flash memory makes program updates easy and eliminates the need to swap parts to accommodate program changes.

The print mechanisms are housed in sound-insulation which make your printer among the quietest impact printers in the world.

Printer Emulations

The following printer emulations (or protocols) are selectable at the control panel:

- Digital LG
- LinePrinter Plus, which consists of:
     IBM® Proprinter® III XL
     Epson® FX-1050
     Printronix P-Series
- IGP/PGL (optional)
- IGP/VGL (optional)

Each emulation provides a different set of configuration menus, control codes, and character sets.

Host Computer Interfaces

The following host computer interface choices are available:

- Centronics® parallel interface
- IEEE® 1284 parallel interface
- Dataproducts® parallel interface
- RS-232 serial interface
- RS-422 serial interface
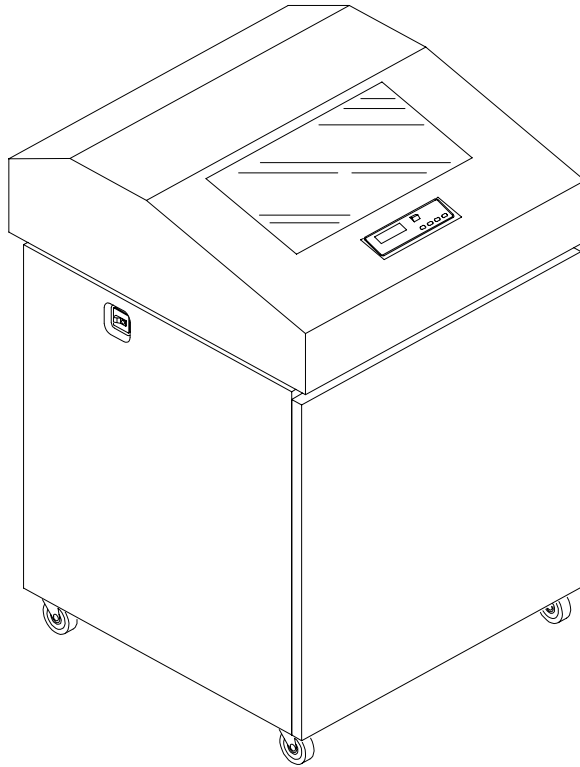
P5205
P5210
P5215
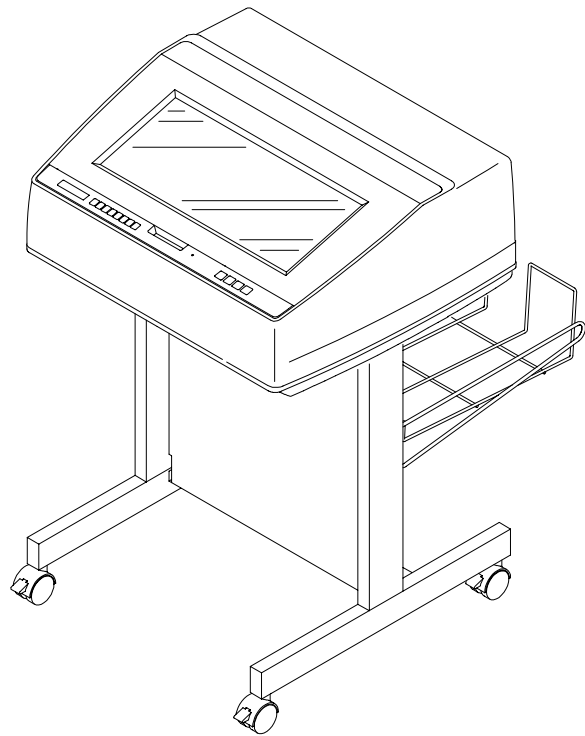
P5005
P5010

Figure 1. The DEC LG Emulation Printers

Graphics Enhancement Option

The IGP/PGL and IGP/VGL emulations allow you to create and store forms, generate logos, bar codes, expanded characters, and create other graphics. Alphanumeric and bar code data are added as the form is printed.

These emulations are available as factory-installed or field-installed options. For more information, contact your authorized service representative.

Taking Care of Your Printer

Your printer will produce high print quality jobs if it is well taken care of. Periodic cleaning, handling the printer properly, and using the correct paper and ribbons, will ensure optimum performance. Chapter 6 explains how to clean the printer, and printer supplies are listed in Appendix A.

Whenever it is necessary to service the printer, remember these important maintenance concepts:

- Use only the ribbons specified in Appendix A. Use of incorrect ribbons can lead to ink migration problems, degraded print quality, and expensive damage to the printer.

- Incorrect closure of the forms thickness lever can lead to smearing, degraded print quality, paper jams, and damage to the platen and shuttle assembly. Never close the forms thickness lever too tightly.

- Printing outside the boundaries of the paper will degrade print quality and cause hammer bank damage. Never print outside of the paper width.

LinePrinter Plus Features

If you have enabled the LinePrinter Plus emulations, your printer will support the following features:

Output Control

The printers have the following output control features:

- Three modes for printing text:

    1) Correspondence (NLQ)

    2) Data Processing (DP)

    3) Draft (high speed)

- Selectable forms length and width

- Character attribute specification:

    1) Selectable pitch: normal, expanded, and compressed

    2) Bold (double-strike) printing

    3) Emphasized (shadow) printing

    4) Automatic underlining and overscoring

    5) Superscript and subscript printing

    6) Double high and wide printing

- Resident multinational character sets

Graphics and Vertical Formatting

Several graphics and vertical formatting features are available:

- Four built-in graphics generators:

    1) IBM Proprinter III XL bit-image graphics

    2) Epson FX dot graphics mode

    3) P-Series Plot

    4) LG Sixel Graphics

- Programmable electronic vertical formatting provides rapid vertical paper movement to specified lines for printing repetitive and continuous forms. You can choose from the following methods:

    1) Vertical tabbing in Proprinter III XL and Epson FX emulation modes

    2) Electronic Vertical Format Unit (EVFU) in P-Series emulation mode

    3) Centronics Vertical Format Unit (CVFU) in P-Series

    4) Dataproducts Vertical Format Unit (DVFU) in P-Series

Built-in Diagnostic Tools

The following diagnostic tools are provided with the printer:

- Comprehensive diagnostic self-tests permanently stored in the printer
- Configuration printout
- Data stream hex code printout

Protocols and Emulations

A protocol is a set of rules governing the exchange of information between the printer and its host computer. These rules consist of codes that manipulate and print data and allow for machine-to-machine communication. A printer and its host computer must use the same protocol. As used in this manual, protocol and emulation mean the same thing.

Most impact printers use single ASCII character codes to print text, numbers, and punctuation marks. Some characters, both singularly and in groups of two or more, are defined as control codes. Control codes instruct the printer to perform specific functions, such as underlining text, printing subscripts, setting page margins, etc. The main difference between most printer protocols is in the characters used to create control codes and the ways in which these characters are formatted.

When the printer executes the character and control codes of a particular printer protocol, it is "emulating" that printer. For example, if the printer uses the Proprinter III XL protocol, it is emulating an IBM Proprinter III XL printer. If the printer is using the Epson FX printer protocol, it is in Epson FX emulation mode.

Line Matrix Printing

Your printer creates characters and graphics by a printing technique called line matrix printing. Line matrix printing consists of printing patterns of ink dots on paper, an entire line at a time.

Each text character is stored in memory as a pattern of dots on a logical grid called the dot matrix. (See Figure 2.) The actual ink dots are made by a row of hammer springs mounted on a shuttle that sweeps rapidly back and forth. Printer logic divides every printable line into horizontal dot rows. The hammer springs put dots at the required positions for the entire line by striking a moving ink ribbon and the paper.

Dot Column

Matrix visible only to
the printer

Dot Row

Ink dots formed by
hammer tips

Character Row

Character Column
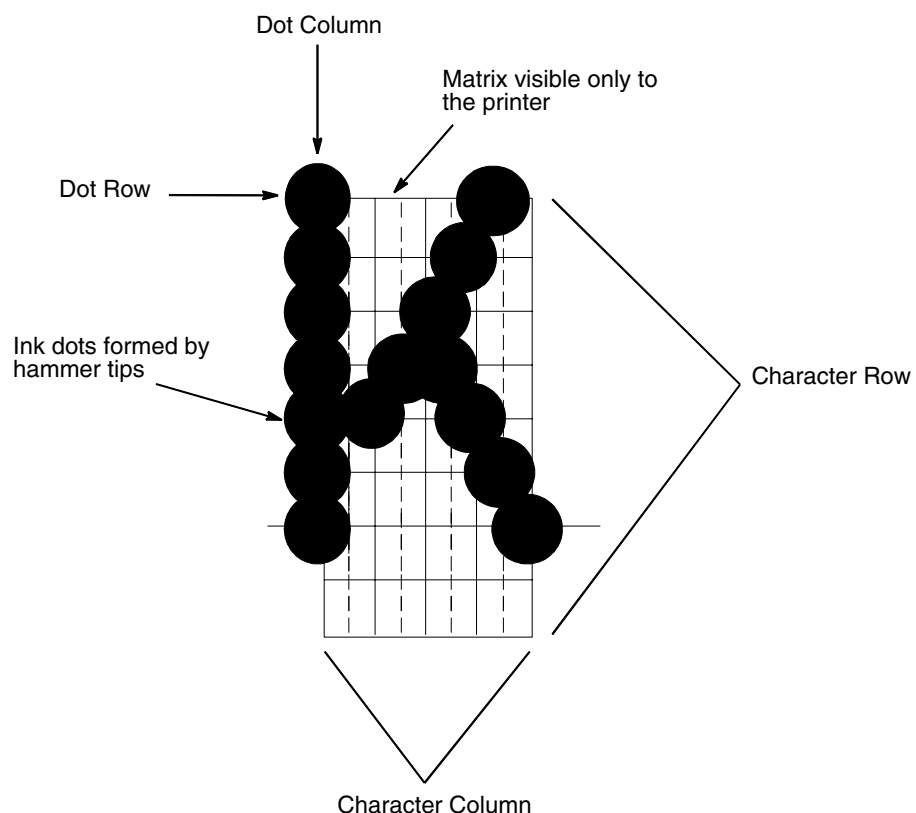
Figure 2. Dot Matrix Character Formation

Unlike serial dot matrix printers, which form complete text characters one at a time with a moving printhead, a line matrix printer divides each printable line into horizontal dot rows, then prints a dot row of the entire line with every lateral sweep of the shuttle. (See Figure 3.)

During each sweep of the shuttle, the hammers print dots at the required positions in the dot row. At the end of a sweep, the shuttle reverses direction, the paper advances one dot row, and the hammers print the next row of dots as the shuttle sweeps in the opposite direction.

After a line of characters is printed, hammer action stops while the paper advances to the first dot row of the next printable line. The number of rows allowed for line separation depends on the line spacing you select.
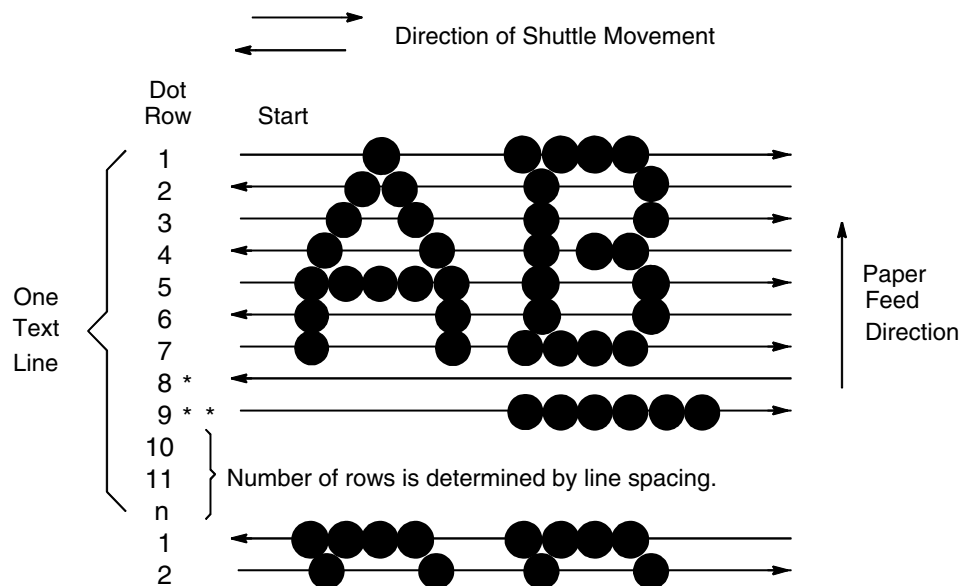
* This row is used only for lowercase descenders.

** This row is used for underlining and lowercase descenders.

Figure 3. Line Matrix Printing

Printing Speed

The speed at which text prints is measured in lines per minute (lpm). This speed is inversely proportional to the number of dot rows required to produce a character line, regardless of the number of characters in the line. More dot rows are required to print lowercase characters with descenders; consequently, those character lines print at a fractionally lower rate.

The printer also prints dot-addressable graphic images. The speed at which graphics are plotted is measured in inches per minute (ipm). Unidirectional plotting produces slightly better print quality and takes about twice as long as bidirectional plotting. You can select either plotting mode from the control panel.

Printing and plotting rates also vary according to the print mode you select. Print mode refers to the way you instruct the printer to create characters. If, for example, you select near letter quality (NLQ) mode, the printer uses more dot rows to form characters than if you choose high speed (HS) mode. Character formation and print speed are faster in HS mode because the printer prints fewer dot rows to form characters. Vertical dot density is a factor in printing speed.

2 *Setting Up the Printer*

Before You Begin

Read this chapter carefully before installing and operating the DEC LG Emulation printer.

The printer is easy to install, but for your safety, and to protect valuable equipment, perform all the procedures in this chapter in the order presented.

Power Requirements

IMPORTANT **It is recommended that printer power be supplied from a separate AC circuit protected at 10 amperes for 120 volts or 5 amperes for 230 volts at 50 or 60 Hertz.**

The printer must be connected to a power outlet that supplies 88 to 135 Volts AC or 178 to 270 Volts AC at 47 to 63 Hz. The printer automatically senses and adjusts itself to conform to the correct voltage range.

Primary circuit protection is provided by the power switch, which is also a circuit breaker. Consult an electrician if printer operation affects local electrical lines. See Appendix A for additional power specifications.

Select a Site

Printer dimensions are shown in Figure 4 and Figure 5. Select a printer site that meets the following requirements:

- Permits complete opening of the printer cover and doors.

- Allows at least three feet of clearance behind the cabinet printer model. (This permits air to circulate freely around the printer and provides access to the paper stacking area.)

- Has a standard power outlet that supplies 100-120 Volts AC or 200-240 Volts AC power, at 47 to 63 Hz. The printer automatically senses and adjusts itself to conform to the correct voltage range. (For the 100-120 Volt outlet, power may fluctuate between 88 and 135 Volts AC. For the 200-240 Volt outlet, power may fluctuate between 178 and 270 Volts.)

- Is relatively dust-free.

- Has a temperature range of 10° C to 40° C (50° F to 104° F), and a relative humidity from 15% to 90% non-condensing.

• Is located within the maximum allowable cable length to the host computer. This distance depends on the type of interface you plan to use, as shown in Table 2:

Table 2. Interface Connections

Interface Type	Maximum Cable Length
Centronics Parallel	5 meters (15 feet)
IEEE 1284 Parallel	10 meters (32 feet)
Dataproducts Parallel	12 meters (40 feet)
Serial RS-232	15 meters (50 feet)
Serial RS-422	1220 meters (4000 feet)
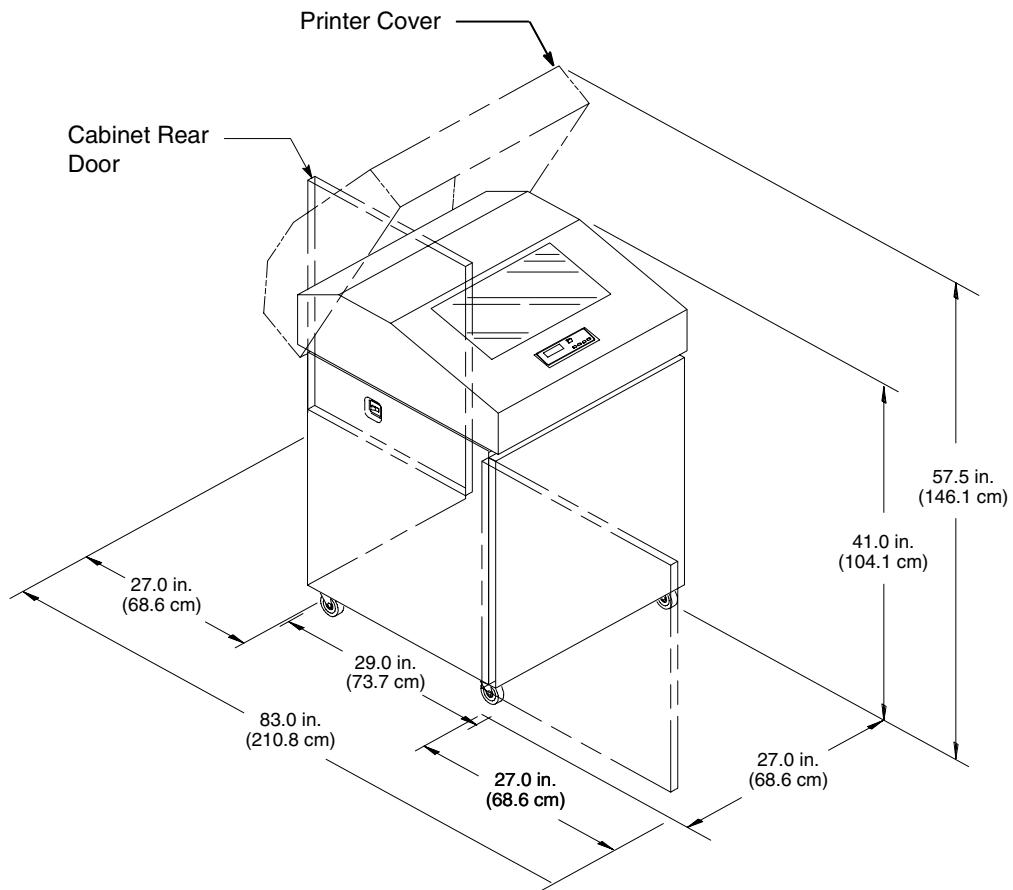
Figure 4. Cabinet Model Dimensions

25 in.
(63.5 cm.)

10.5 in.
(26.67 cm.)

48.0 in.
(122 cm.)

24.6 in.
(62.48 cm.)

30 in.
(76.2 cm.)
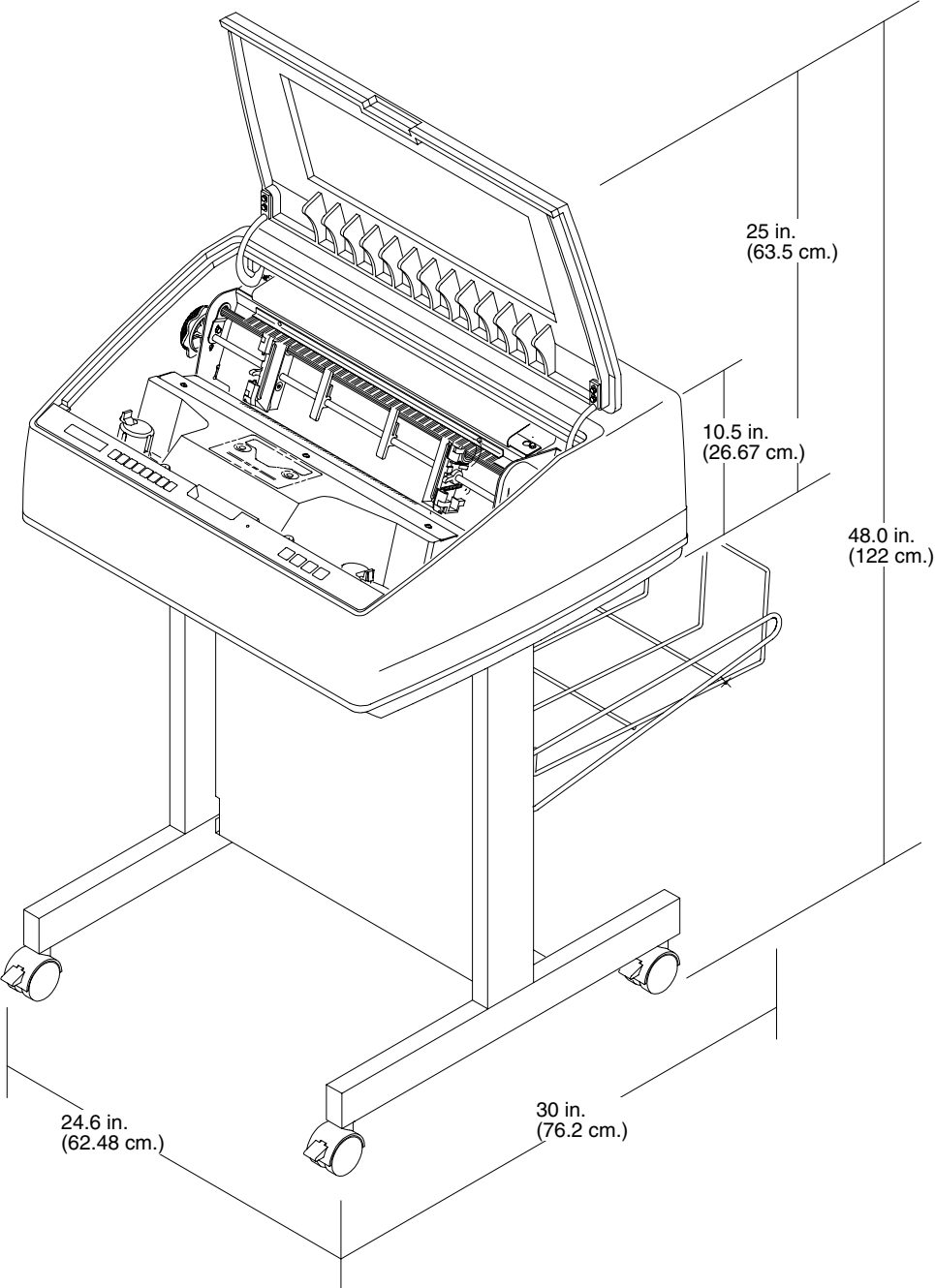
Figure 5. Pedestal Model Dimensions

Printer Component Locations

Familiarize yourself with the names and locations of the printer components shown in Figure 6 before continuing with the rest of the installation procedure.
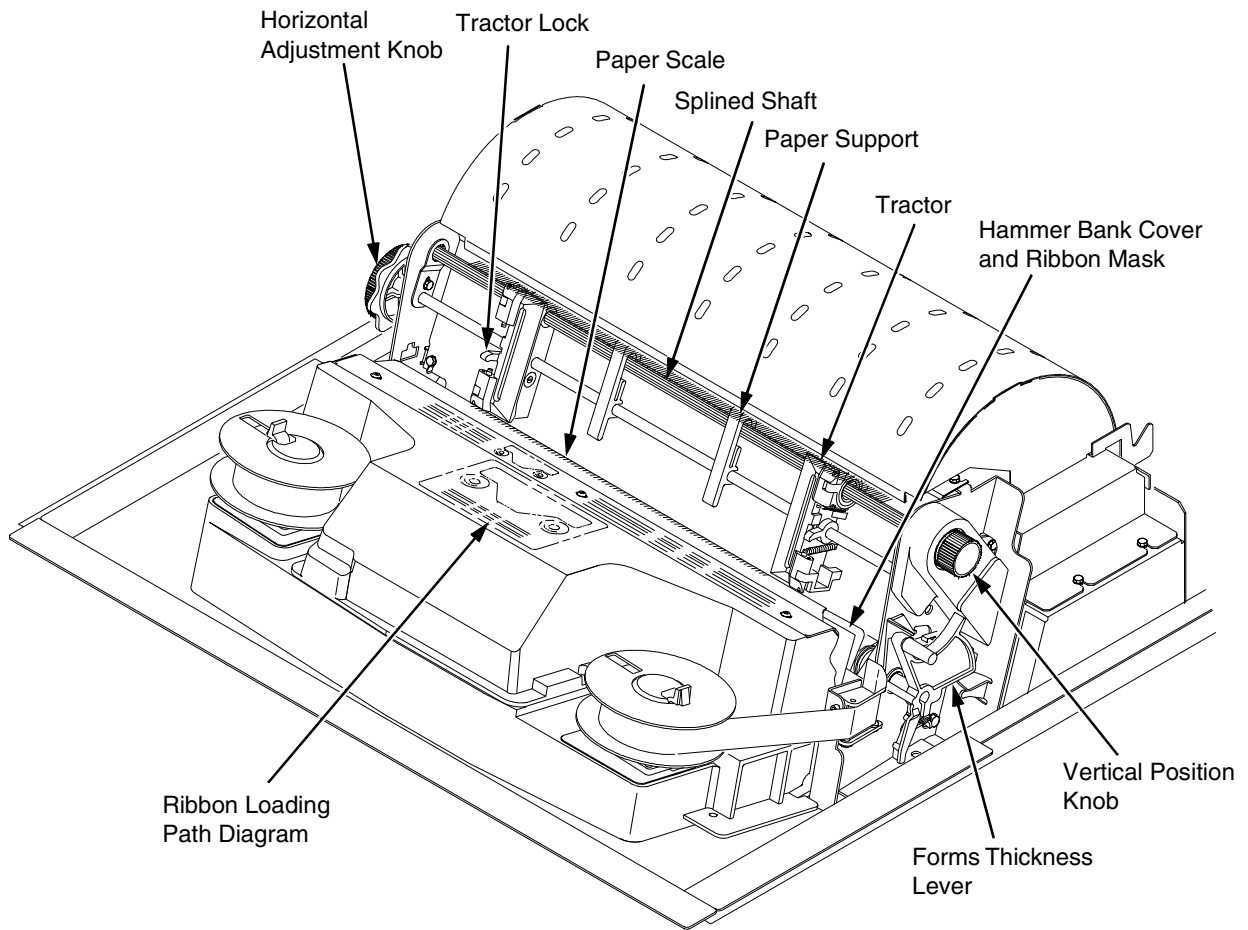
Figure 6. Component Locations

Remove the Shipping Restraints (Cabinet Model)

Cardboard packing, protective foam, and tie wraps protect printer mechanisms from damage during shipment. This section describes how to remove these shipping restraints from the cabinet model before you operate the printer.

Save the cardboard packing, foam blocks, and bubble wrap along with the other packing materials, since you may need to reinstall them.

If it is necessary to move the printer, reinstall the shipping restraints. Reverse the steps in this section.

CAUTION **To avoid shipping damage, reinstall the shipping restraints whenever you move or ship the printer.**

Remove the Cardboard Packing

Cardboard
Packing (2)
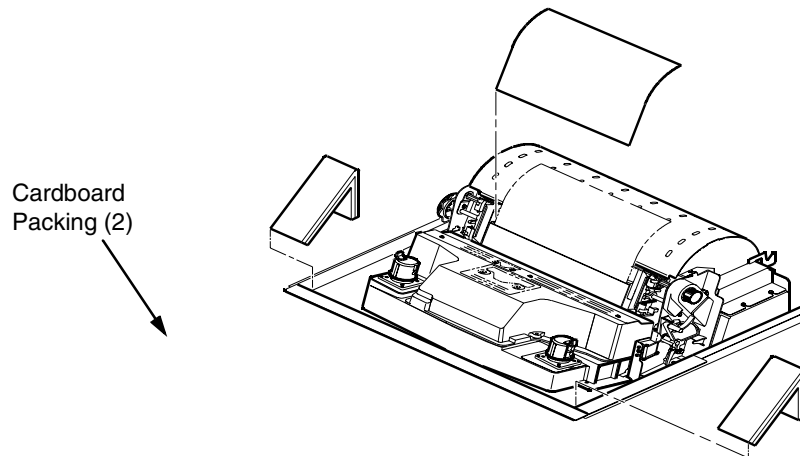
55blocks
August 8, 2000

Figure 7. Removing the Cardboard Packing

1. Raise the printer cover.

2. Remove the cardboard packing.

3. Remove the envelope that contains the sample configuration printout. Store this in the pouch that is attached to the left interior side of the cabinet.

21

Remove the Hammer Bank Protective Foam and Foam Strips

Hammer Bank
Protective Foam

Foam Strips (2)

Tractor Door
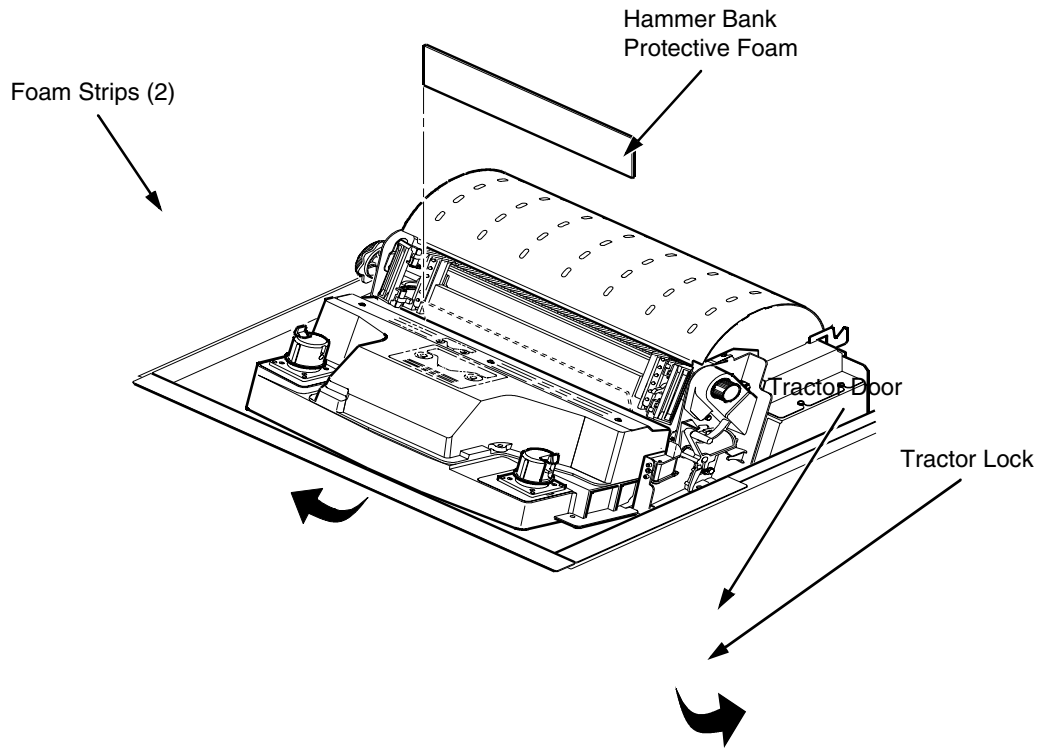
Tractor Lock

Figure 8. Removing the Hammer Bank Protective Foam and Foam Strips

1. Open the tractor doors. Push the tractor locks down. Slide the tractors and paper supports outward as far as they will go. The forms thickness lever should be in the fully open (raised) position.

2. Lift the hammer bank protective foam and remove it from between the ribbon mask and the platen.

3. Remove the foam strips and the tape securing the foam strips.

Remove the Platen Protective Foam

Figure 9. Removing the Platen Protective Foam

1. Rotate the forms thickness lever downward to position "A".

2. Rotate the platen protective foam toward the front of the printer and out from under the support shaft. Remove the platen protective foam.

Adjust the Paper Supports

Tractor Door

Paper Supports

Tractor Door

Figure 10. Adjusting Paper Supports

1. Slide paper supports inward until they are approximately four inches from the tractor door.

Release the Paper Chains

Figure 11. Releasing the Paper Chains

1. Open the cabinet rear door.

2. Cut the tie wraps and release the paper chains from the bags at the top rear of the printer frame. Remove the tie wraps and bags.

3. Make sure each chain hangs freely, with no kinks or knots.

Remove the Tags
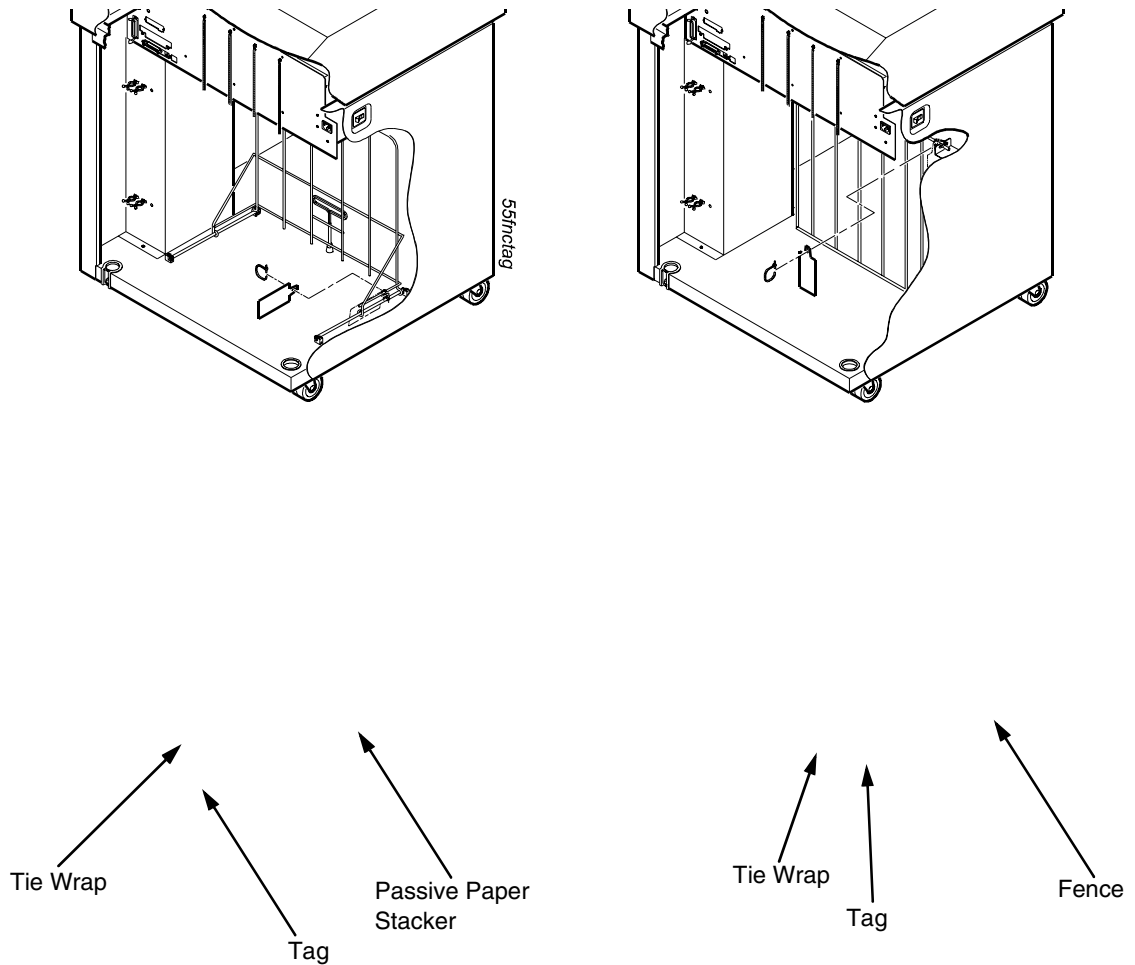
Figure 12. Remove Tag and Tie Wrap from Fence or Passive Paper Stacker

1. Remove the tie wrap and large red tag attached to the passive paper stacker.

2. Close the cabinet rear door.

3. Close the printer cover.

Attach the Control Panel Overlays

Figure 13. Attaching Control Panel Overlay

1. Choose the overlay labels in the appropriate language.

2. Open the printer cover, peel off the back of the overlay and apply to the control panel.

Remove the Shipping Restraints (Pedestal Model)

Protective films and foam blocks protect printer mechanisms from damage during shipment. This section describes how to remove these shipping restraints from the pedestal model before you operate the printer.

Save the foam blocks, since you may need to reinstall them.

If it is necessary to move the printer, reinstall the shipping restraints. Reverse the steps in this section.

CAUTION   **To avoid shipping damage, reinstall the shipping restraints whenever you move or ship the printer.**

Remove the Hammer Bank Protective Foam
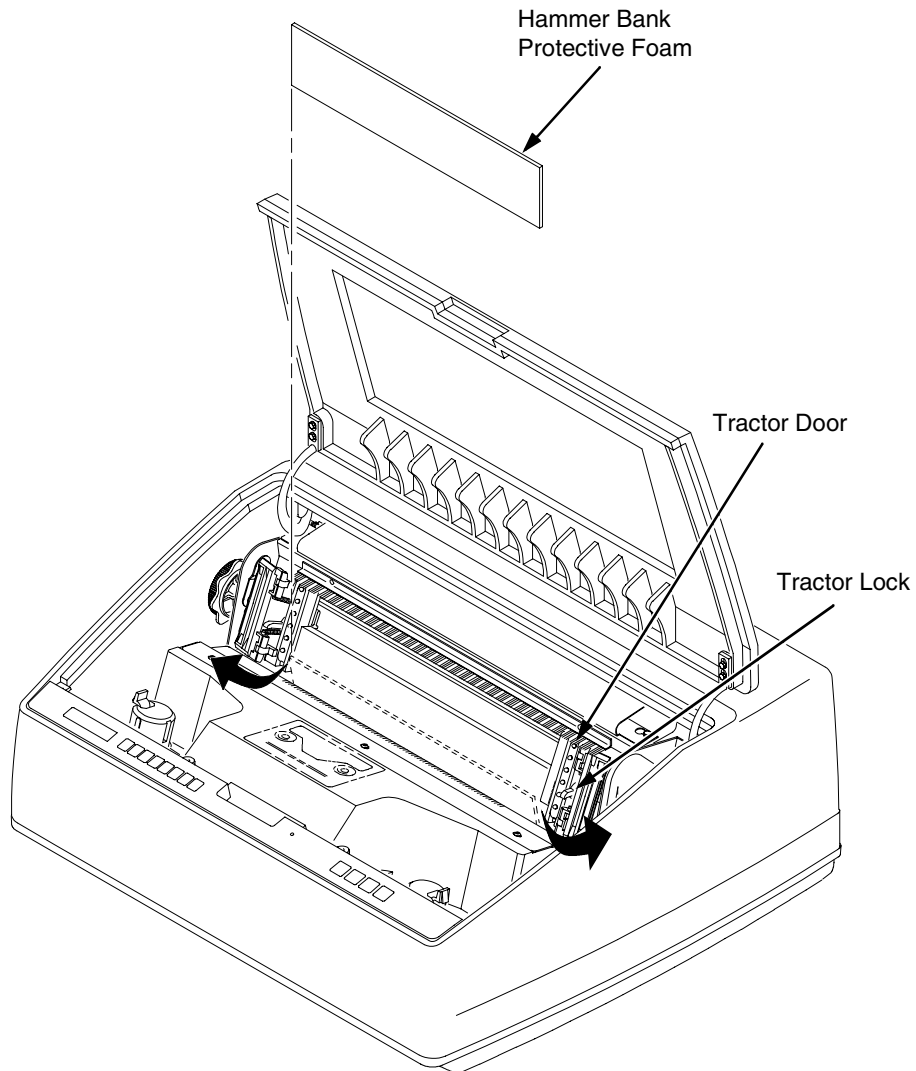
Figure 14. Removing the Hammer Bank Protective Foam

1. Raise the printer cover.

2. Open the tractor doors. Push the tractor locks down. Slide the tractors and paper supports outward as far as they will go. The forms thickness lever should be raised (in the fully open position).

3. Remove the envelope that contains the sample configuration printout.

4. Lift the hammer bank protective foam and remove it from between the ribbon mask and the platen.

Remove the Platen Protective Foam

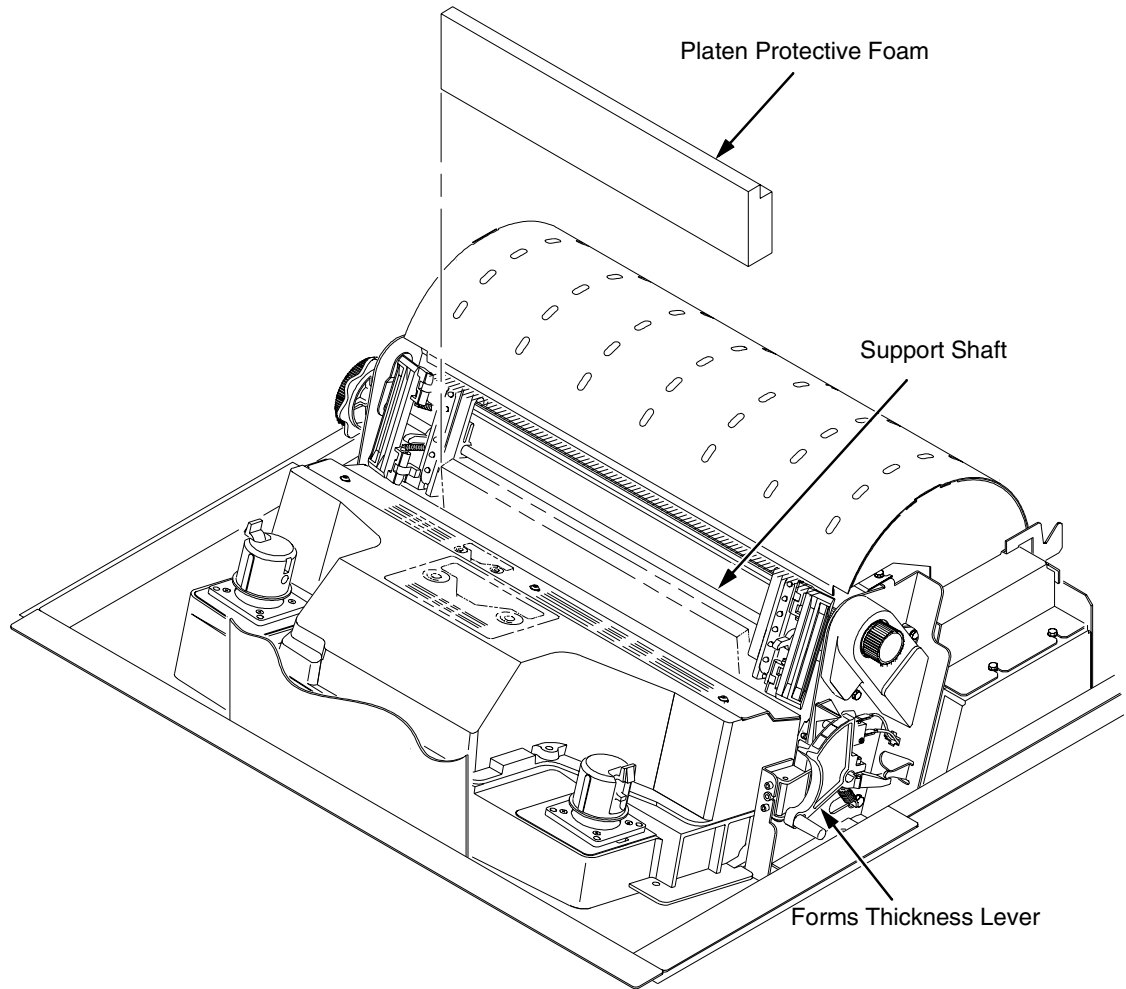Platen Protective
Foam

Support Shaft

Forms Thickness
Lever
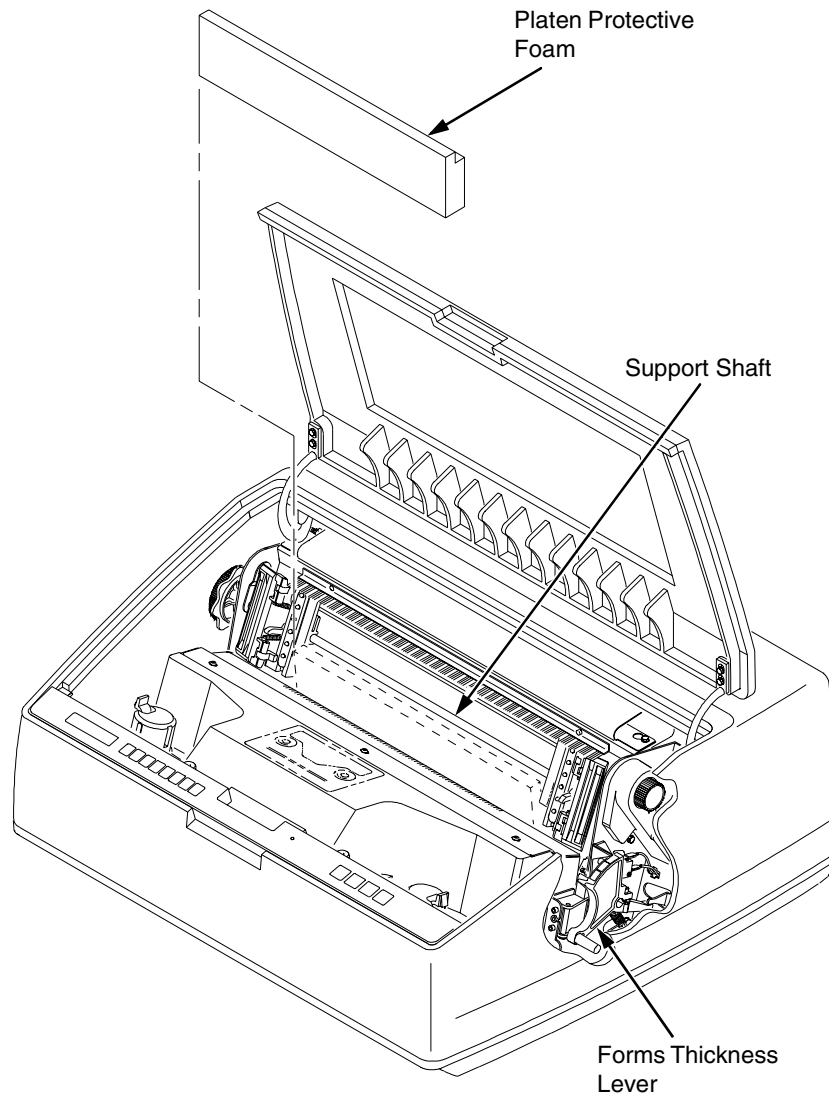
Figure 15. Removing Platen Protective Foam

1. Rotate the forms thickness lever downward to position "A".

2. Rotate the platen protective foam toward the front of the printer and out from under the support shaft. Remove the platen protective foam.
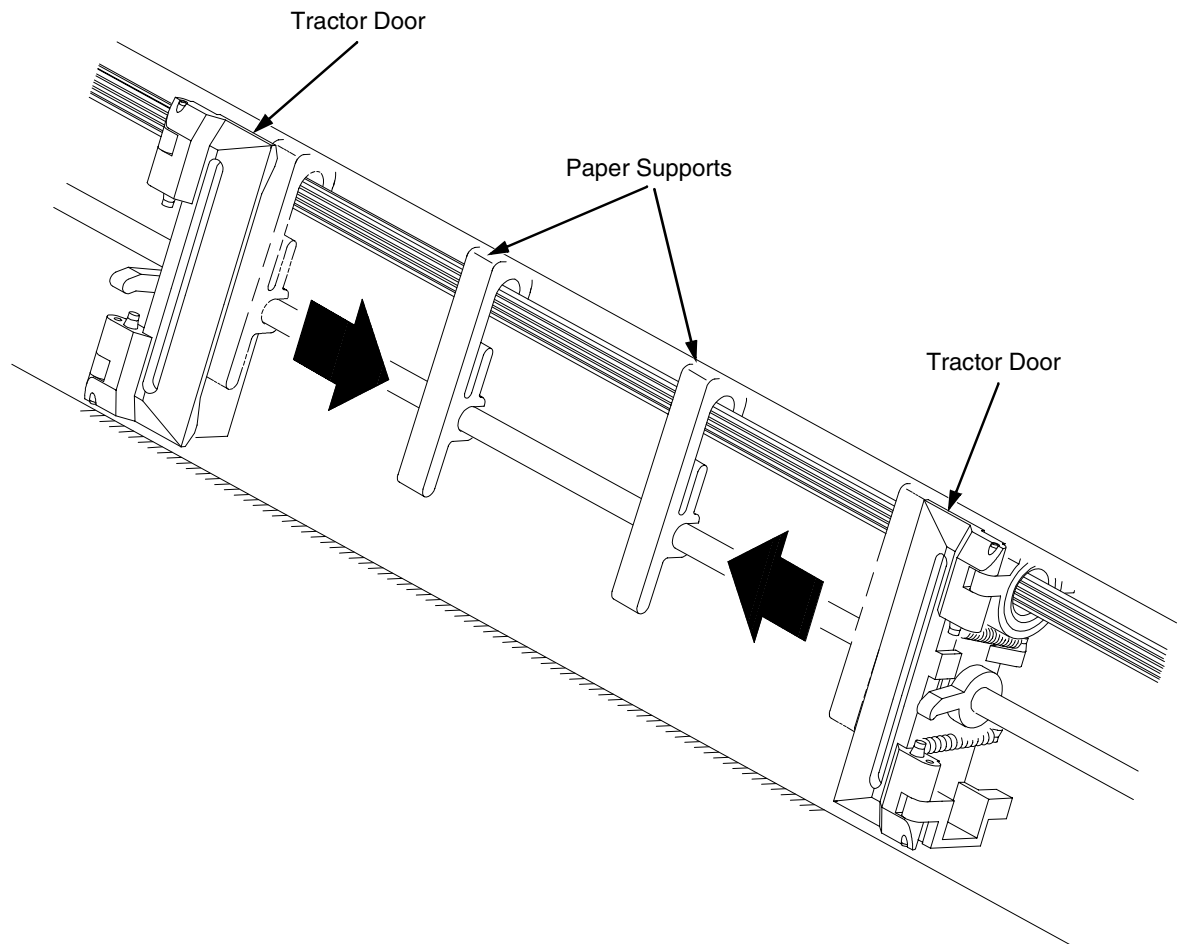
Adjust the Paper Supports

Tractor Door

Paper Supports
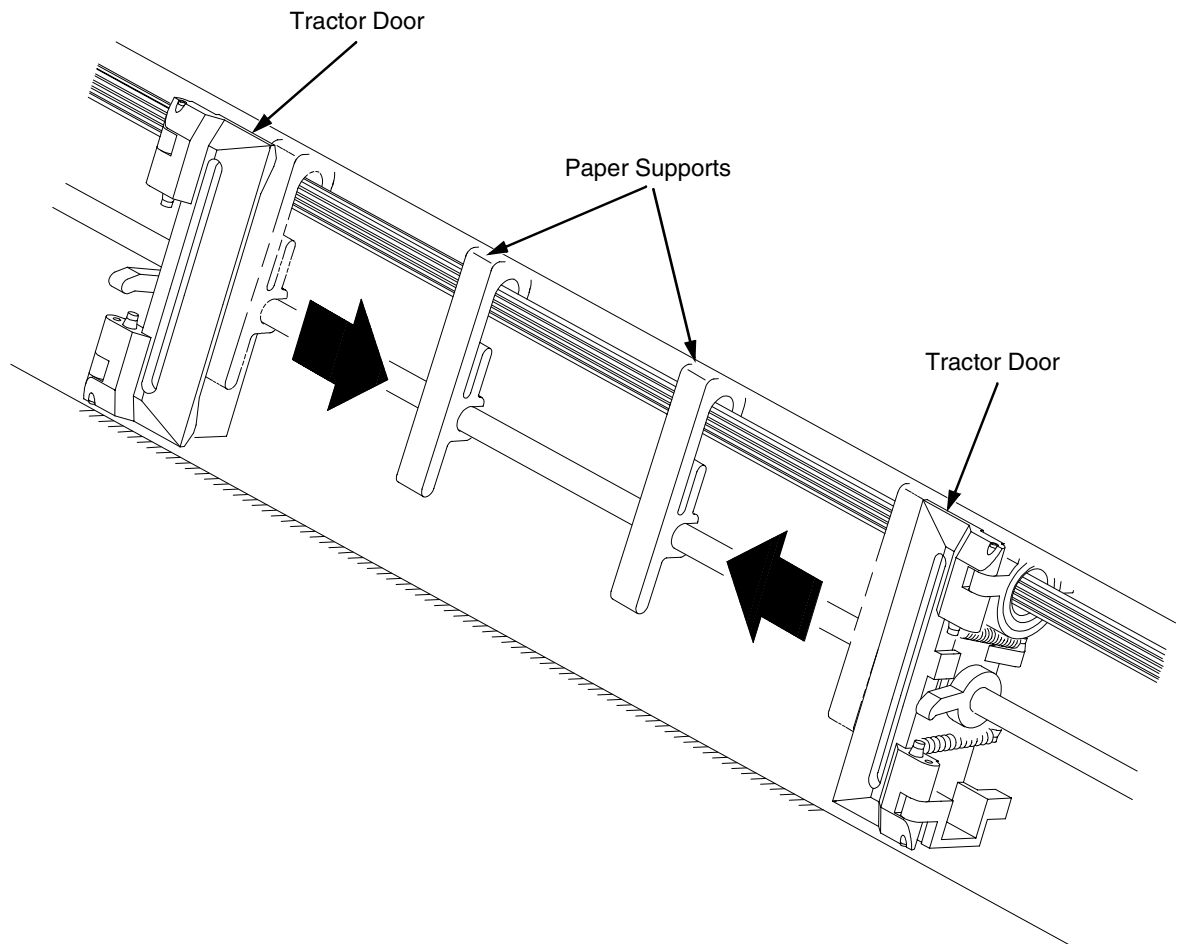
Tractor Door

Figure 16. Adjusting Paper Supports

1. Slide paper supports inward until they are approximately four inches from the tractor door.

2. Close the printer cover.
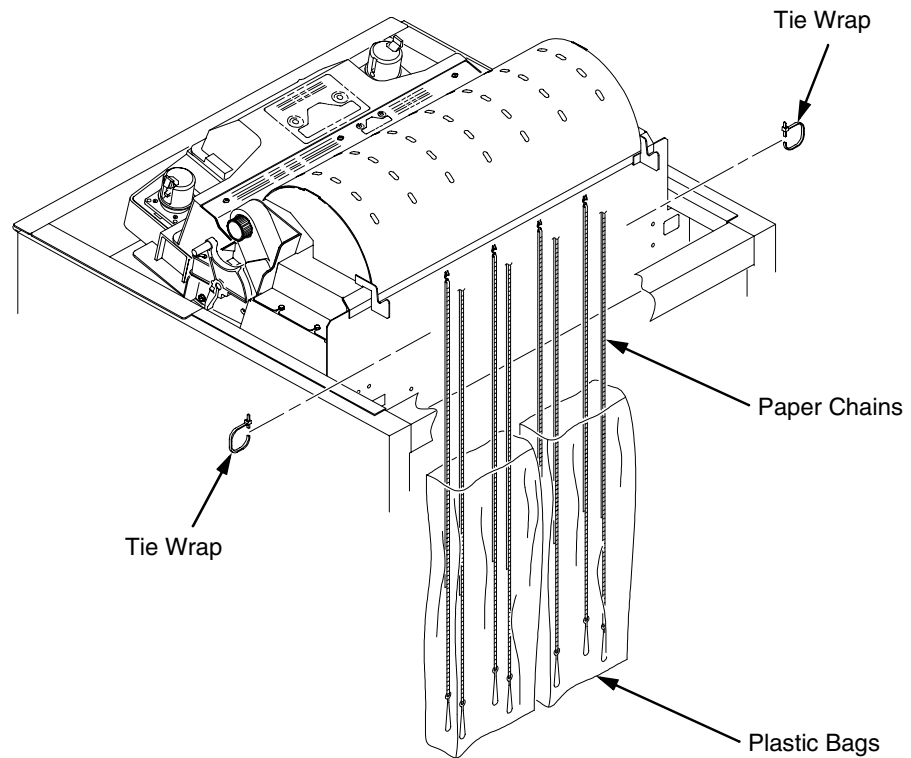
Remove Tag
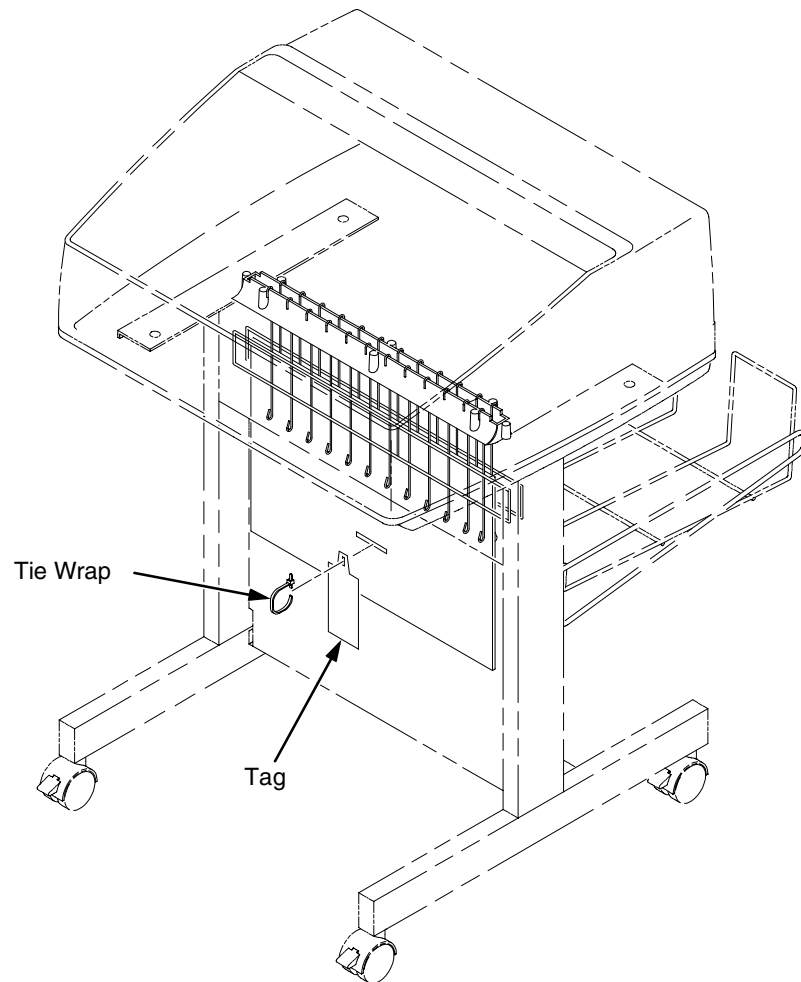
Figure 17. Removing Tag from Cage

Remove the tie wrap attached to the wireform paper path. It is marked with a large, red tag.

Attach the Output Basket
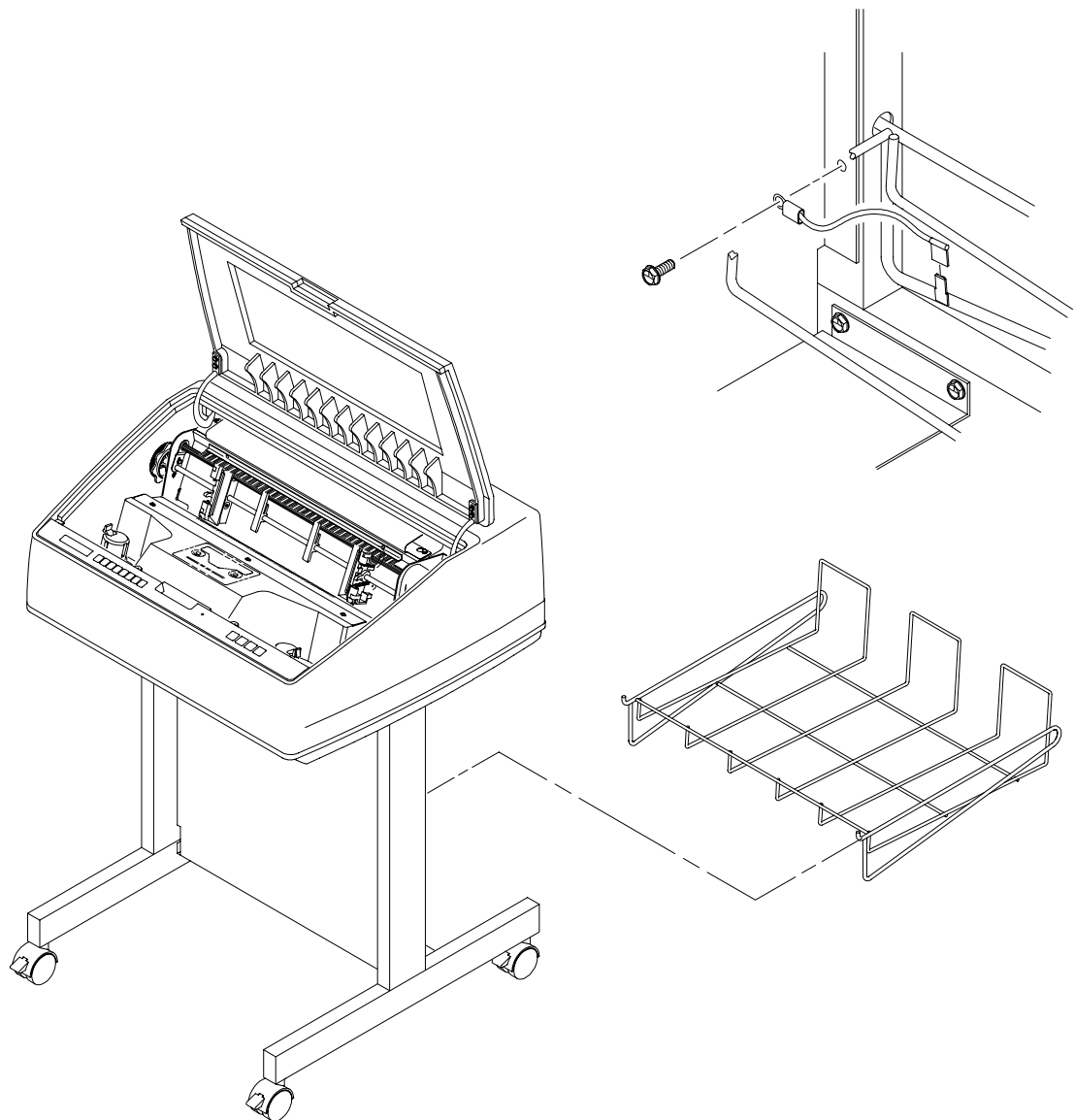
Figure 18. Attaching the Output Basket

1. Place the output basket in the holes in the back of the printer.
2. Screw the ground wire attached to the output basket to the printer.
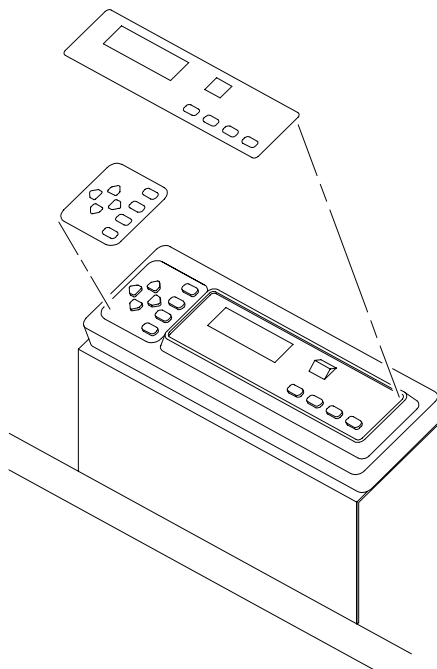
Attach the Control Panel Overlays
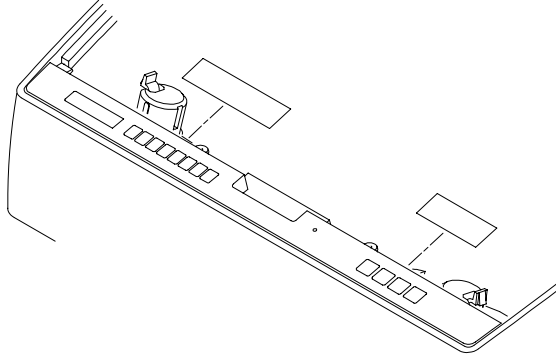
Figure 19. Attaching Control Panel Overlays

1. Choose the overlay labels in the appropriate language.

2. Open the printer cover and insert overlay labels by sliding them behind the control panel assembly in the appropriate place.

Install Basic Components

The following section gives instructions on essential procedures which keep your printer operational on a day-to-day basis.

Connect the Interface and Power Cables

Before you connect the interface and power cables, verify the voltage source at the printer site conforms to the requirements specified on page 17. Make sure the printer power switch is set to OFF (see Figure 21).

WARNING **To prevent serious personal injury from electrical shock when connecting or disconnecting the host interface (signal) cable, make sure that the printer is powered off and the power cable is unplugged.**

WARNUNG **Um ernstliche körperliche Verletzungen durch Stromschlag beim Anschließen oder Trennen des Signalton-Kabels zu vermeiden, muß der Drucker auf jeden Fall ausgeschaltet und der Netzstecker herausgezogen werden.**

ATTENTION **Afin d'éviter tout risque de blessure par électrocution lors du branchement ou du débranchement du câble de signal, mettre l'imprimante hors tension et débrancher le câble d'alimentation.**

Pedestal Model   **Cabinet Model**
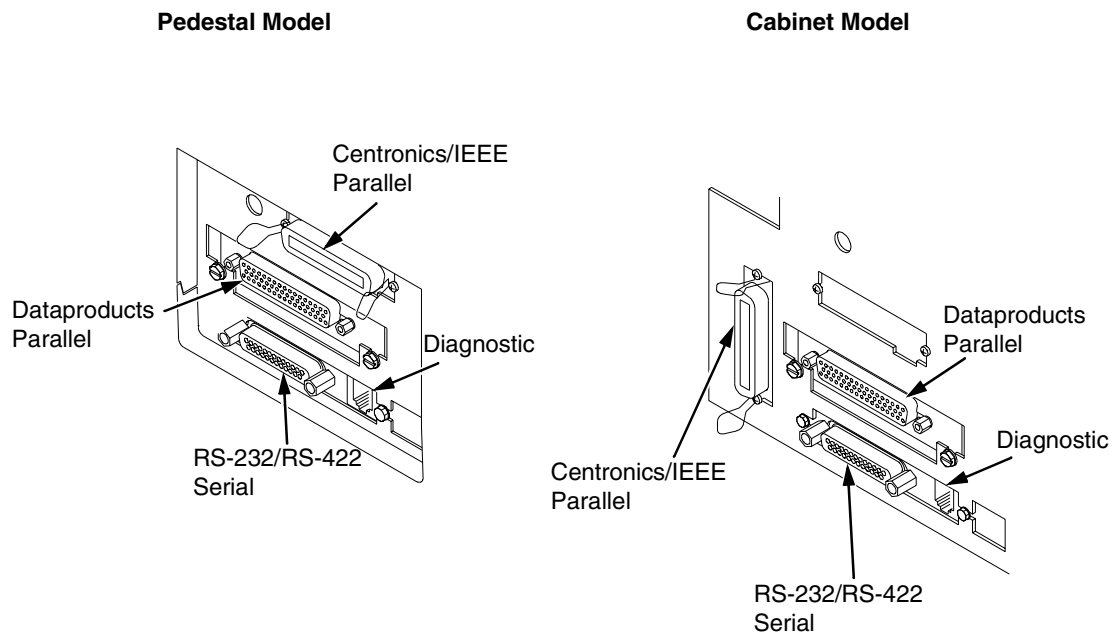
Figure 20. Cable Connection Locations

Cabinet Model

Pedestal Model

Host Interface
Connectors

I/O Cover

OFF/ON

Host Interface
Connectors

AC Power
Connector

Power Switch

AC Power Cable

Cable-Routing
Notch (2)
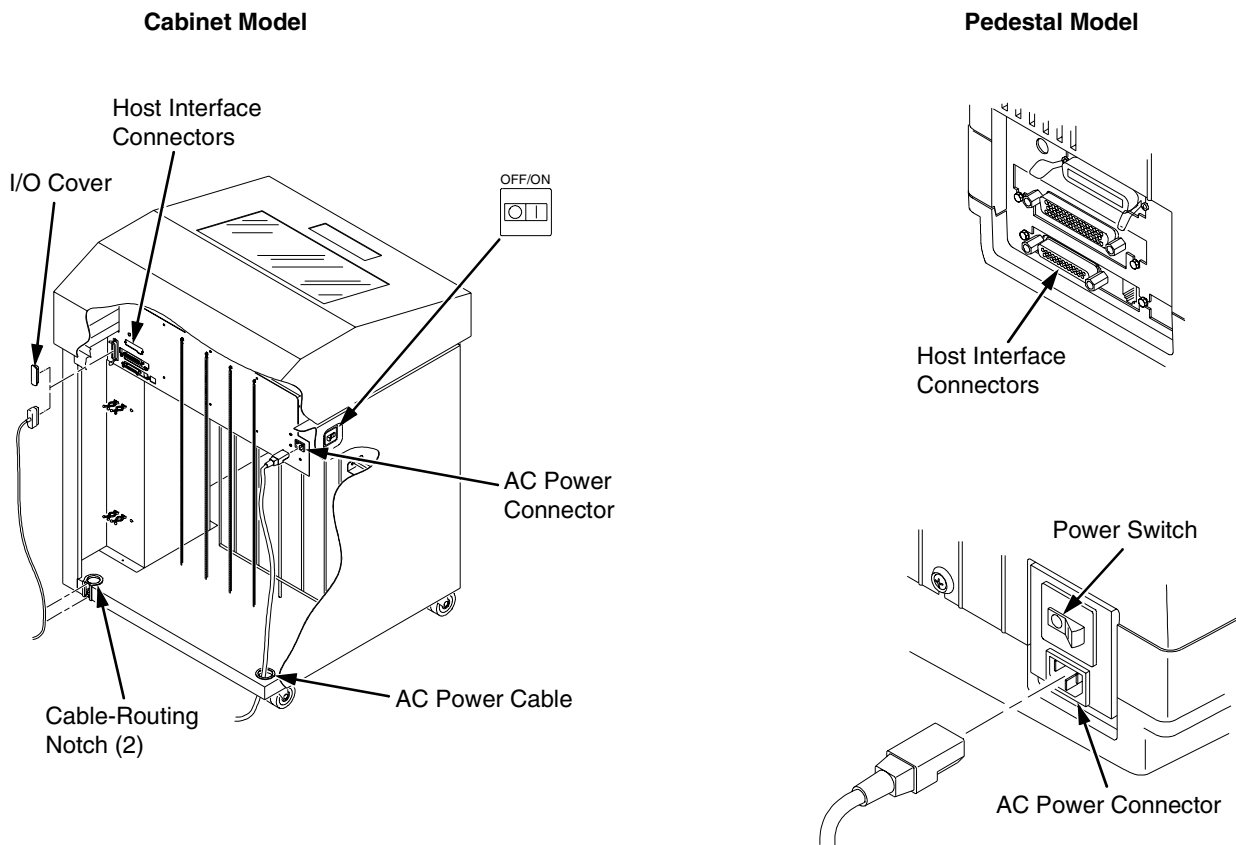
AC Power Connector

Figure 21. Interface and Power Locations

1. Make sure the printer power switch is set to OFF (see Figure 21).
    Connect the (customer-supplied) interface cable from the host computer
    to the appropriate printer interface connector (see Figure 20). Refer to
    Chapter 5, "Interfaces," for descriptions of the connectors and their pin
    assignments.

    a. Remove the cover from the interface connector you have selected.

    b. Hold the interface cable below its connector, and gently attach the
        cable connector to the printer interface connector.

2. Plug the power cord into the printer AC power connector, then into the AC
    power outlet (see Figure 21).

Install the Ribbon
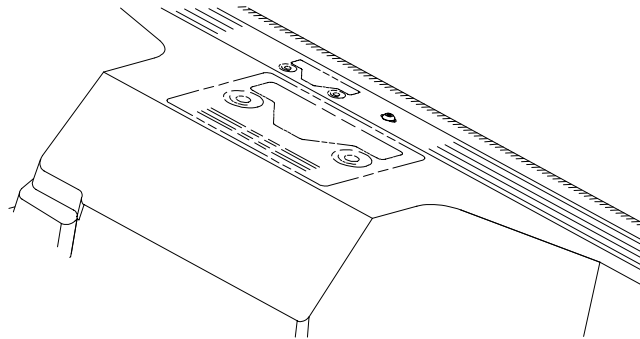
Figure 22. Ribbon Path Diagram Location

1. Refer to the ribbon path diagram molded onto the shuttle cover.
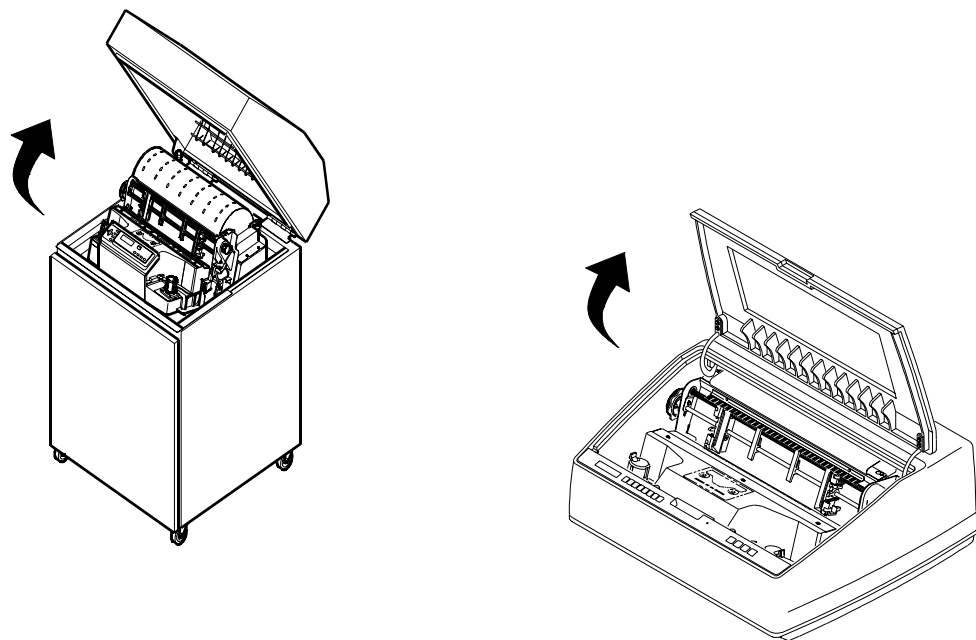
55cabopn
MAy 1, 2001

Figure 23. Opening the Printer Cover

2. Verify that the printer is offline and that the printer cover is open.

Tractor Door

Forms Thickness Lever
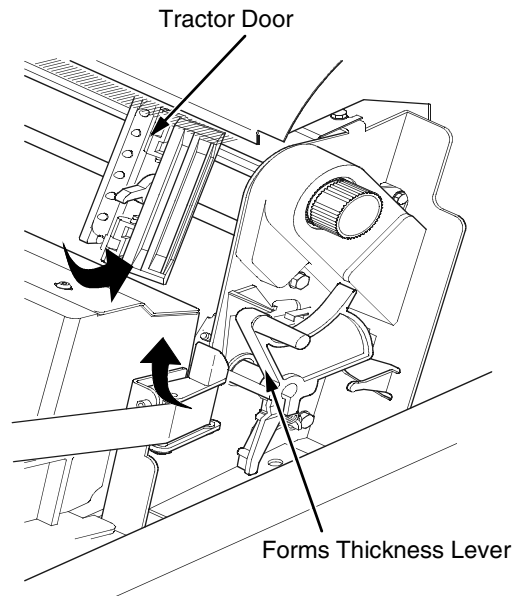
Figure 24. Forms Thickness Lever

3. Raise the forms thickness lever as far as it will go.

4. Swing open the tractor doors.
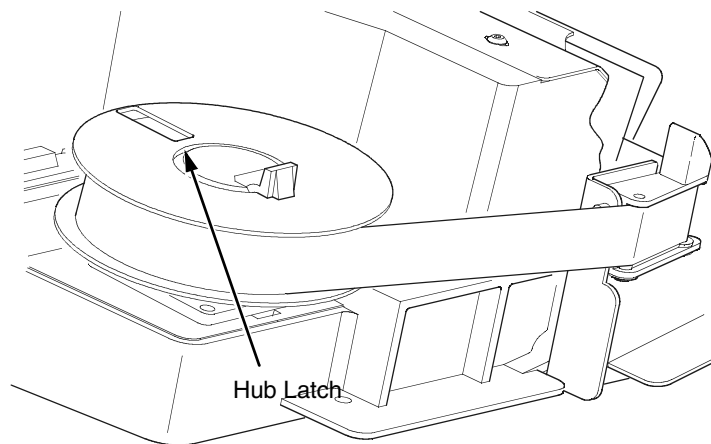
Hub Latch

Figure 25. Right Hub Latch

5. Squeeze the right hub latch and place the full spool on the right hub. Be sure the ribbon feeds off the outside of the spool. Press the spool down until the hub latch snaps into place.

Hammer Bank Cover

Ribbon Mask

Paper

Ribbon Mask

Hammer Bank Cover

Platen

Ribbon

Front of
Printer

Hammer Tip

55rib2a
April 27, 2001
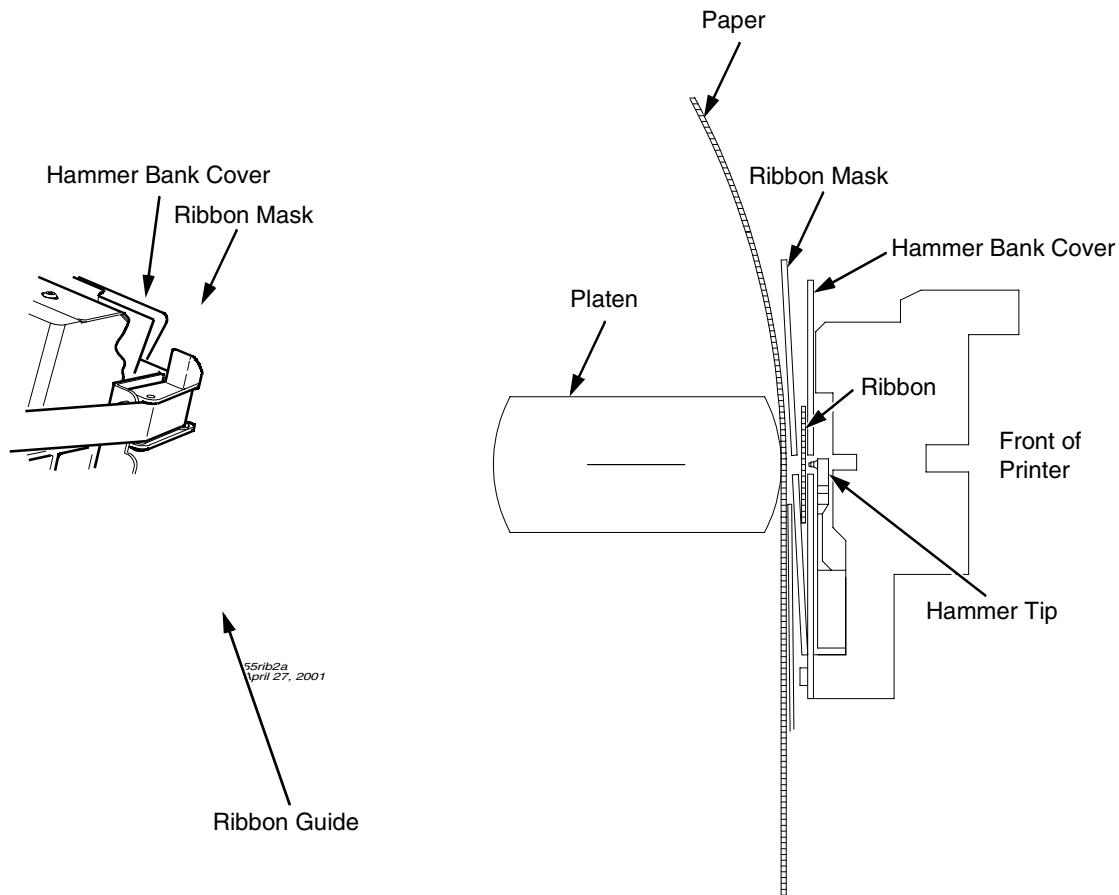
Ribbon Guide

Figure 26. Ribbon Path

6. Thread the ribbon around the ribbon guide and along the ribbon path.
   Refer to the ribbon path diagram on the shuttle cover. Be sure to thread
   the ribbon between the hammer bank cover and the ribbon mask.

CAUTION **The ribbon must not be twisted. A twisted ribbon can lower print quality,
shorten ribbon life, and cause paper jams.**

Cabinet Model
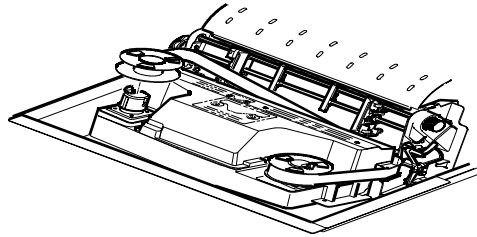
55rib3
August 15, 2000

Pedestal Model
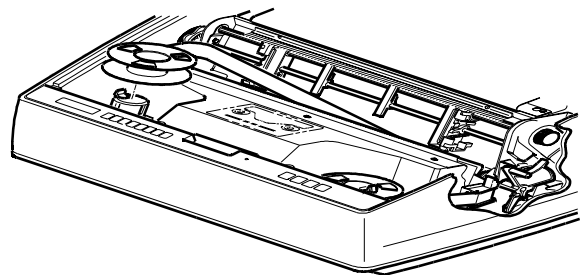
p55rib3
May 1, 2001

Figure 27. Left Ribbon Hub

7. Place the empty spool on the left hub. Press the spool down until the hub
    latch snaps into place. Turn the spool by hand to make sure the ribbon
    tracks correctly in the ribbon path and ribbon guides.

Load the Paper

This section explains how to load paper for the first time. If you are loading paper over existing paper, see the *Operator's Guide.*
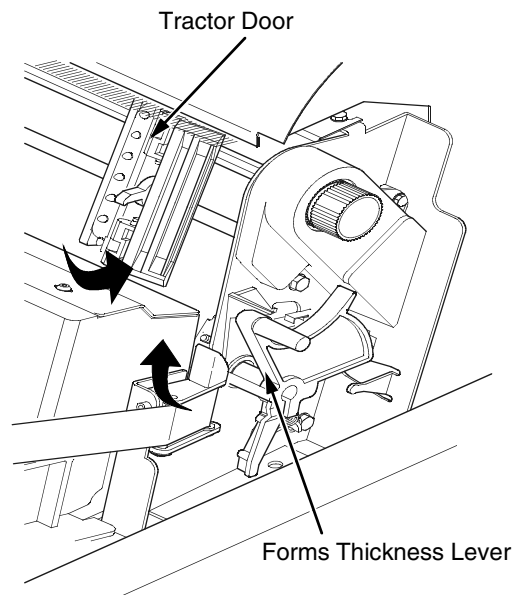
Figure 28. Forms Thickness Lever and Tractor Doors

When you start this procedure, verify that the printer cover is open, the forms thickness lever is raised, and the tractor doors are open.
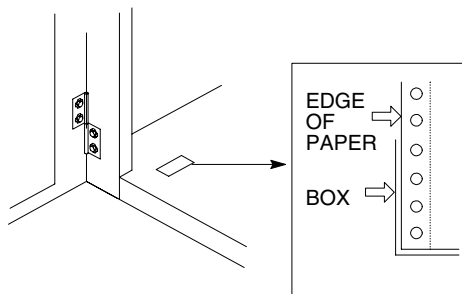
Figure 29. Paper Supply Label Location

1. On cabinet models, open the front door. Align the paper supply with the label on the floor. Ensure that the paper pulls freely from the box.

Paper Slot is 8 inches
below printer base
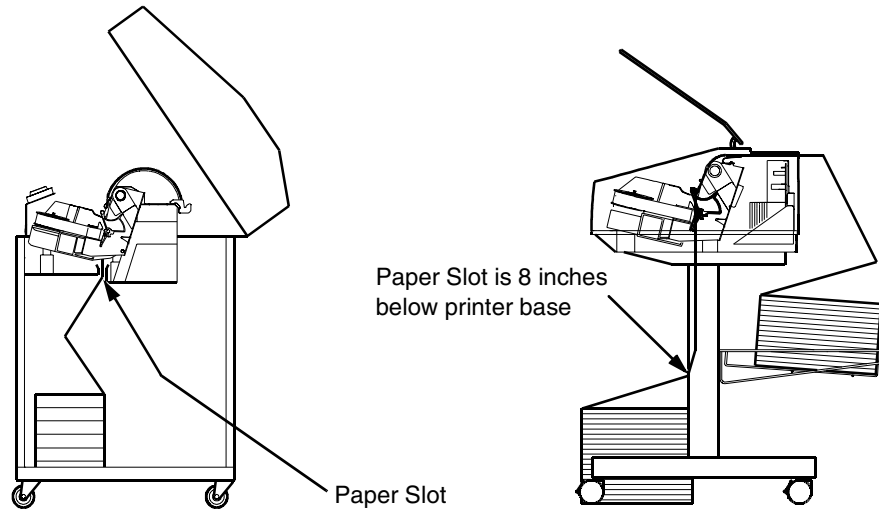
Paper Slot

Figure 30. Paper Slot Location

2. Feed the paper up through the paper slot. Hold the paper in place with
    one hand (to prevent it from slipping down through the paper slot) while
    pulling it through from above with your other hand.

Tractor Door

Paper

Tractor Lock

Ribbon Path Diagram
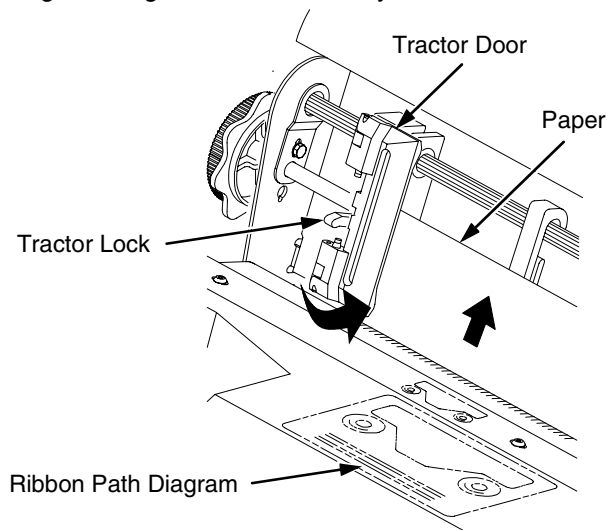
Figure 31. Loading Paper Onto the Left Tractor Sprockets

3. Pull the paper above and behind the ribbon mask, which is a silver metal
    strip with a clear plastic edge protector. Refer to the ribbon path diagram
    on the shuttle cover. Load the paper on the left tractor sprockets and
    close the tractor door. Normally, you should not need to adjust the
    position of the left tractor.
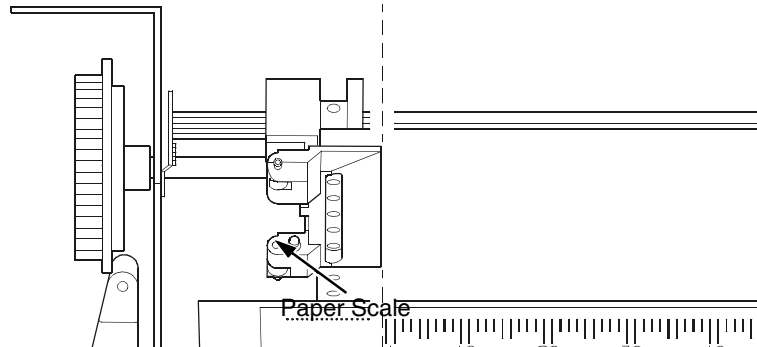
Figure 32. Paper Scale

4. If adjustment is necessary, unlock the left tractor. Slide the tractor until it is directly to the left of the number "1" on the paper scale and lock it. (You can also use the paper scale to count columns.)

CAUTION **To avoid damage to the printer caused by printing on the platen, always position the left tractor unit directly to the left of the "1" mark on the paper scale.**
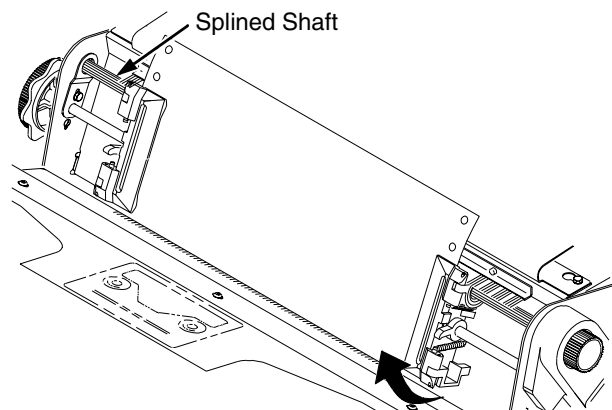
Figure 33. Loading Paper Onto the Right Tractor Sprockets

5. Unlock the right tractor.

6. Load the paper onto the sprockets and close the tractor door. Make sure the leading edge of the first sheet of paper is perfectly parallel to the tractor splined shaft (paper is not crooked). If paper is crooked, reload it onto the tractor sprockets until its edge is parallel to the splined shaft.

7. Slide the right tractor to remove paper slack or to adjust for various paper widths. Then lock the tractor.
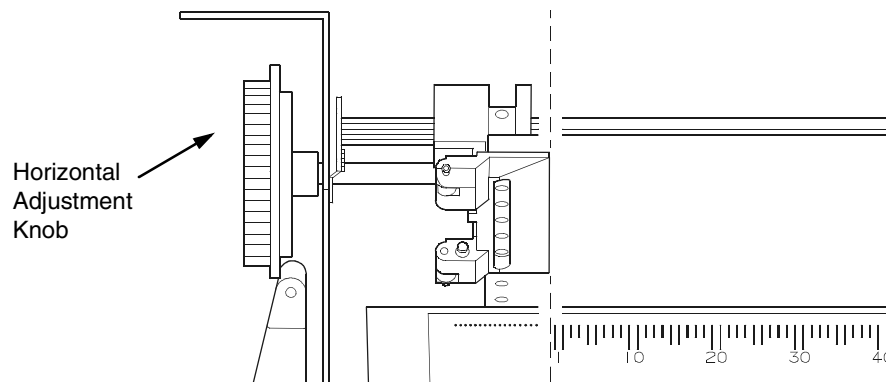
Figure 34. Horizontal Adjustment Knob

8. After both tractors are secured, you may use the horizontal adjustment knob to make fine horizontal paper adjustments.

A Thin Paper

B Medium Paper

C Thick Paper
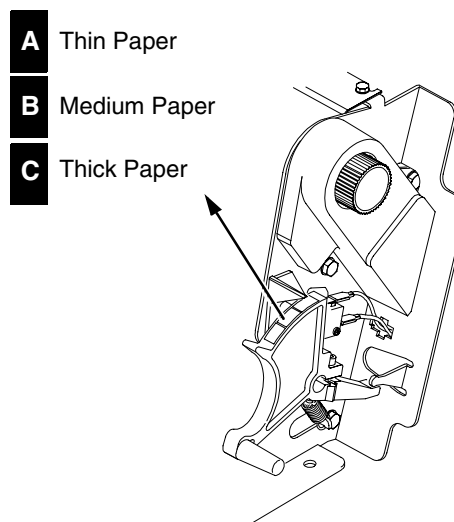
Figure 35. Lowering the Forms Thickness Lever

9. Lower the forms thickness lever. Set it to match the paper thickness. The A-B-C scale corresponds approximately to 1-, 3-, and 6-part paper thickness. Adjust until you have the desired print quality.

NOTE: Do not set the forms thickness lever too tightly; excessive friction can cause paper jams, ribbon jams with potential for ribbon damage, smeared ink, or wavy print.

10. For cabinet models, close the cabinet front door.

11. Continue on to the next section to power on the printer.

Power On the Printer

Following are instructions for powering on the printer after you have installed the ribbon and loaded paper.
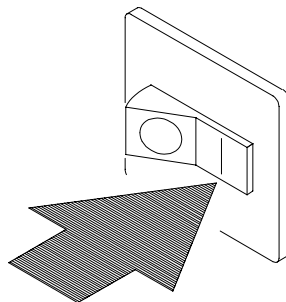
Figure 36. The Power Switch

1. When you start this procedure, verify that paper and ribbon are installed, the forms thickness lever is lowered, and the tractor doors are closed. This prevents a "LOAD PAPER" or "CLOSE PLATEN" error message from displaying after the printer is powered on.

2. Set the power switch to the ON position (Figure 36). The printer initializes and runs several self-tests. The messages "TESTING HARDWARE / PLEASE WAIT" and "DIAGNOSTICS / PASSED" will each display briefly. When the self-tests complete and the software has initialized successfully, the message "ONLINE / LG" appears on the message display.

    If the status indicator flashes and a fault message displays, this indicates a fault condition; refer to the fault messages section in Chapter 6, "Routine Service and Diagnostics."

Set the Top-of-Form

Following are instructions for setting the top-of-form after you have powered on the printer.

Paper Path
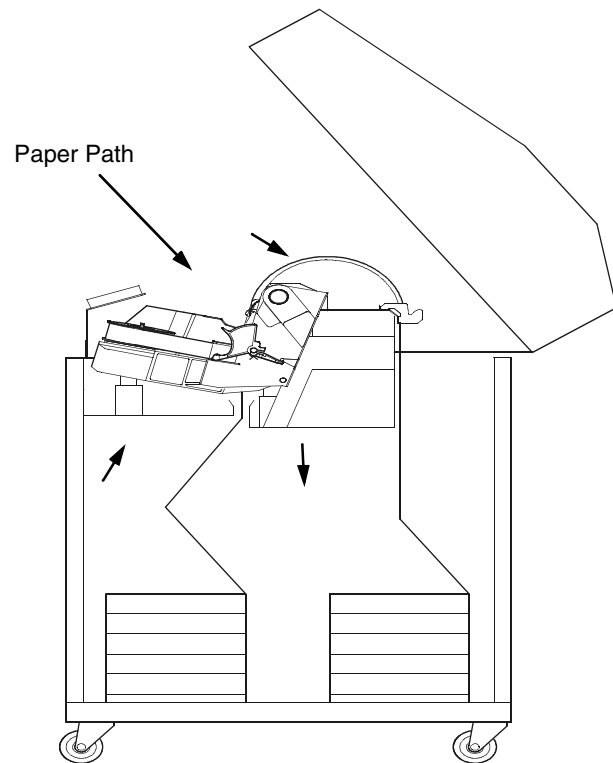
Figure 37. The Lower Paper Guide

1. When you start this procedure, verify that the printer is in offline mode, with the printer cover open and the forms thickness lever lowered.

2. Press the FF key several times to ensure the paper feeds properly beyond the tractors and over the lower paper path. Ensure the paper folds in the same way in the stacking area as it does in the supply area.
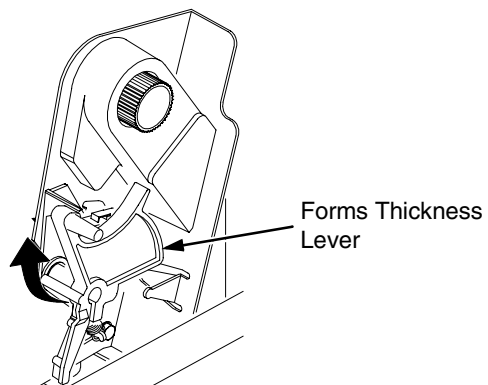
Figure 38. Raising the Forms Thickness Lever

3. Raise the forms thickness lever as far as it will go. This allows you to turn the vertical position knob freely in order to align the top-of-form.
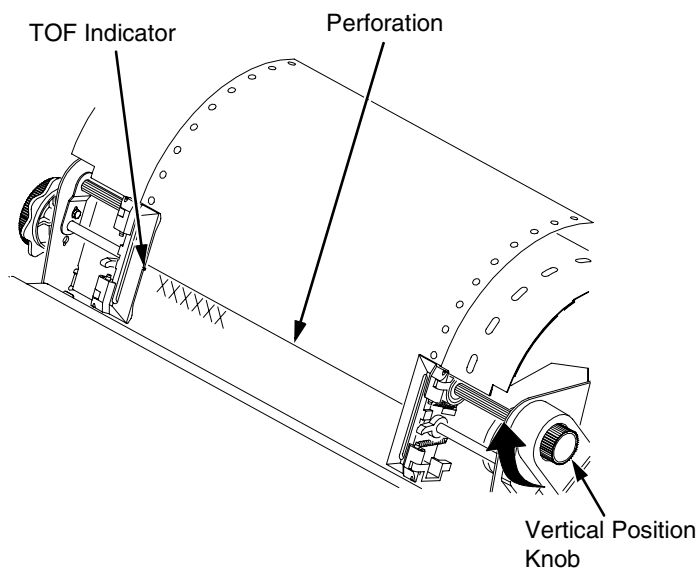
Figure 39. Aligning the Top-of-Form

4. Locate the TOF indicator. It is the small tab located on the tractor doors.

5. Turn the vertical position knob to align the top of the first print line with the TOF indicator.

A Thin Paper

B Medium Paper

C Thick Paper
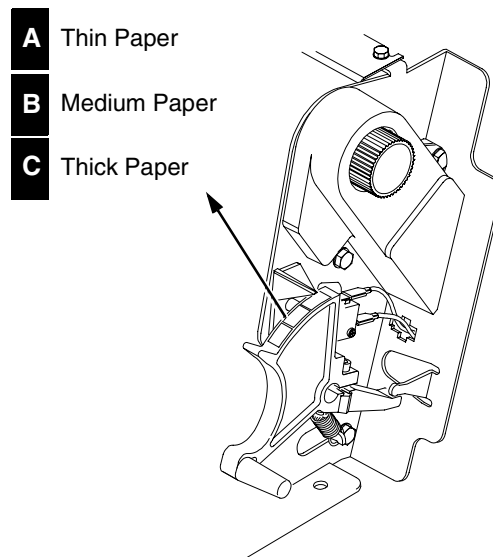
Figure 40. Lowering the Forms Thickness Lever

6. Lower the forms thickness lever. Set it to match the paper thickness. The A-B-C scale corresponds approximately to 1-, 3-, and 6-part paper thickness. Adjust until you have the desired print quality.

NOTE: Do not set the forms thickness lever too tightly; excessive friction can cause paper jams, ribbon jams with potential for ribbon damage, smeared ink, or wavy print.
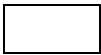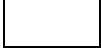
IMPORTANT   **The forms thickness lever must be closed; otherwise, there will be no paper movement when you press SET TOF.**

7. Press SET TOF. The top-of-form position that you have set moves down to the print position.

8. Go on to the next procedure to run a simple printer test.

Test the Printer

Table 3. Printer Test Procedure

Step	Key	Result	Notes
1.	Make sure that the printer top cover is open and the forms thickness lever is lowered.		
2.	ONLINE	OFFLINE CONFIG. CONTROL	The printer must be off line for testing.
3.	△ + ⬠	ENTER SWITCH UNLOCKED	Allows you to make configuration changes.
		OFFLINE CONFIG. CONTROL	
4.	⬠ UNTIL	OFFLINE DIAGNOSTICS	
5.	⬠	DIAGNOSTICS Printer Tests	
6.	⬠	Printer Tests Shift Recycle*	
7.	R/S	Printer Tests Shift Recycle*	The printer outputs a sliding alphabet pattern.
8.	R/S	Printer Tests Shift Recycle*	Stops test.
9.	△ + ⬠	ENTER SWITCH LOCKED	Locks the configuration parameters.
10.	CLEAR	OFFLINE CONFIG. CONTROL	Moves the printer out of the menus to offline.
11.	Examine the print quality. The characters should be fully formed and of uniform density. If the test does not run or characters appear malformed, contact your authorized customer service engineer.		
12.	If the print quality is good, close the printer cover; press ONLINE to enable printing. To select an emulation and configure the printer with the control panel, go to Chapter 3.		

3 | *Configuring the Printer*

Overview

IMPORTANT   **Configuration directly affects printer operation. Do not change the configuration of your printer until you are thoroughly familiar with the procedures in this chapter.**

In order to print data, the printer must respond correctly to signals and commands received from the host computer. Configuration is the process of matching the printer operating characteristics to those of the host computer and to specific tasks, such as printing labels, or printing on different sizes of paper. The characteristics that define the printer's response to signals and commands received from the host computer are called configuration parameters.

You can configure the printer using the configuration menus and the control panel, or by sending control codes in the data stream from a host computer attached to the printer.

This chapter provides a tutorial introduction. Figure 41 shows an overview of the configuration menus.

Following the menu is background information on topics such as changing and saving parameters, custom configurations, and operating modes. Several step-by-step procedures are also provided that show how to change configuration parameters and how to save, print, and load configurations from printer memory. For details on the entire set of configuration menu options, see Chapter 4.

The host control codes for each emulation are described in their corresponding *Programmer's Reference Manual*. See "Related Documents" on page 9 for more information.
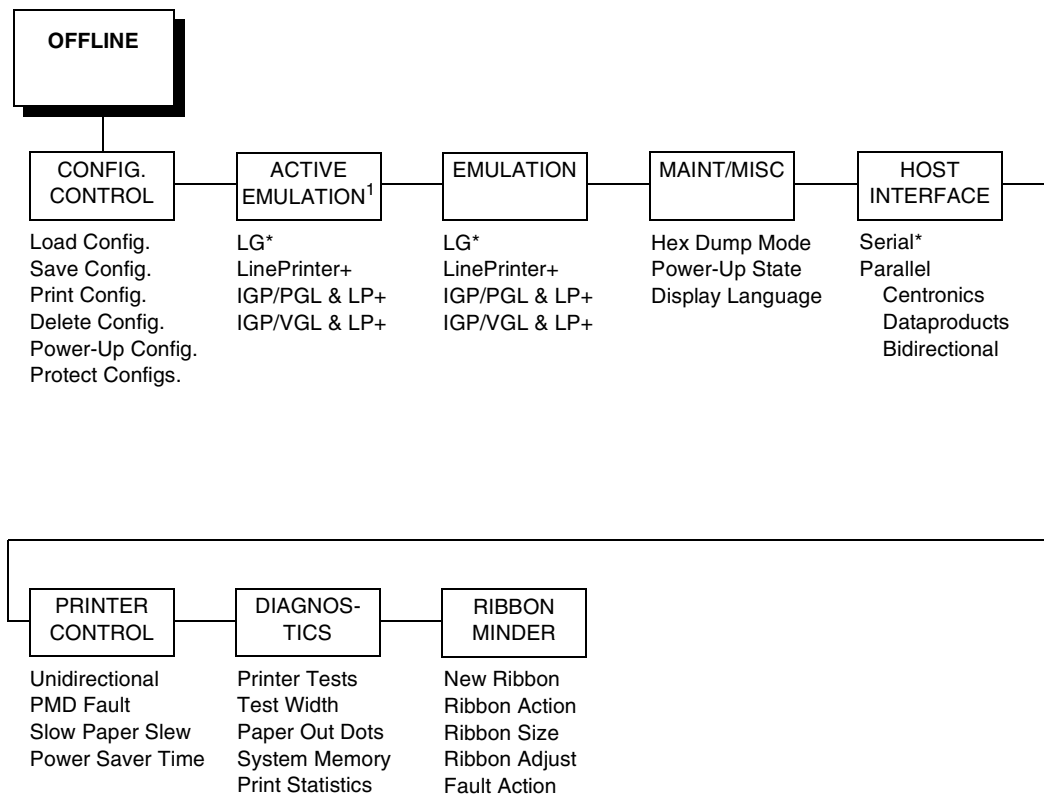
```
                    ┌─────────────┐
                    │  OFFLINE    │
                    └─────────────┘
```

CONFIG. CONTROL	ACTIVE EMULATION[1]	EMULATION	MAINT/MISC	HOST INTERFACE
Load Config.	LG*	LG*	Hex Dump Mode	Serial*
Save Config.	LinePrinter+	LinePrinter+	Power-Up State	Parallel
Print Config.	IGP/PGL & LP+	IGP/PGL & LP+	Display Language	Centronics
Delete Config.	IGP/VGL & LP+	IGP/VGL & LP+		Dataproducts
Power-Up Config.				Bidirectional
Protect Configs.				

PRINTER CONTROL	DIAGNOS-TICS	RIBBON MINDER
Unidirectional	Printer Tests	New Ribbon
PMD Fault	Test Width	Ribbon Action
Slow Paper Slew	Paper Out Dots	Ribbon Size
Power Saver Time	System Memory	Ribbon Adjust
	Print Statistics	Fault Action

To view options, press: ⇓ Down
⇑ Up
⇒ Next
⇐ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ONLINE.

* = Default Setting

[1] Choices available are limited to the emulations configured with the printer.

Figure 41. Configuration Menu Overview

Changing and Saving Parameter Settings

You can change a parameter setting, such as line spacing or forms length, by pressing keys on the control panel or by sending emulation control codes in the host data stream. Refer to the appropriate *Programmer's Reference Manual* for information about control codes.

When you change a parameter, it is active as long as the printer is on or until changed. This is true whether you used the control panel or sent a control code from the host.

If you use the control panel, you can save the parameters as a customized configuration. A configuration consists of a group of parameters. A saved configuration will not be lost if you turn off the printer although the printer will not power up in this configuration unless saved as the power-up configuration.

You can change a parameter with a control code, but to save the parameter setting you must use the control panel.

Control codes override control panel parameters. For example, if you set the line spacing to 6 lpi with the control panel, and application software later changed this to 8 lpi with a control code, the control code setting overrides the control panel setting.

The 8 lpi parameter is effective as long as the printer is on or until changed. If you turn off the printer, the 8 lpi parameter will be erased. To save the parameter, you must use the control panel and save it as a configuration.

Default and Custom Configurations

A configuration consists of a group of parameter settings, such as line spacing, forms length, etc. Your printer provides a fixed default configuration and also allows you to define several custom configurations for use with particular print jobs.

- The factory default configuration (configuration 0) can be loaded, but it cannot be altered. See page 53 for a list of all the factory default parameter values.

- Eight configurations can be modified for unique print job requirements. The "Save Config." option allows you to save eight groups of parameter settings in non-volatile memory as custom configurations numbered from 1 through 8. See page 57 for an explanation of how to save a set of parameter values as a custom configuration using the "Save Config." menu option.

Operating Modes

The printer has three operating modes: online mode, offline mode, and fault mode.

- **Online Mode.** When the printer is online, it is controlled by the host computer and prints data sent by the host computer.

- **Offline Mode.** In offline mode, communication with the host is interrupted so that you can load paper, change ribbons, or test and configure the printer.

- **Fault Mode.** When the printer is in fault mode, it has encountered an error condition, and printing stops until the error condition is cleared.

The Control Panels
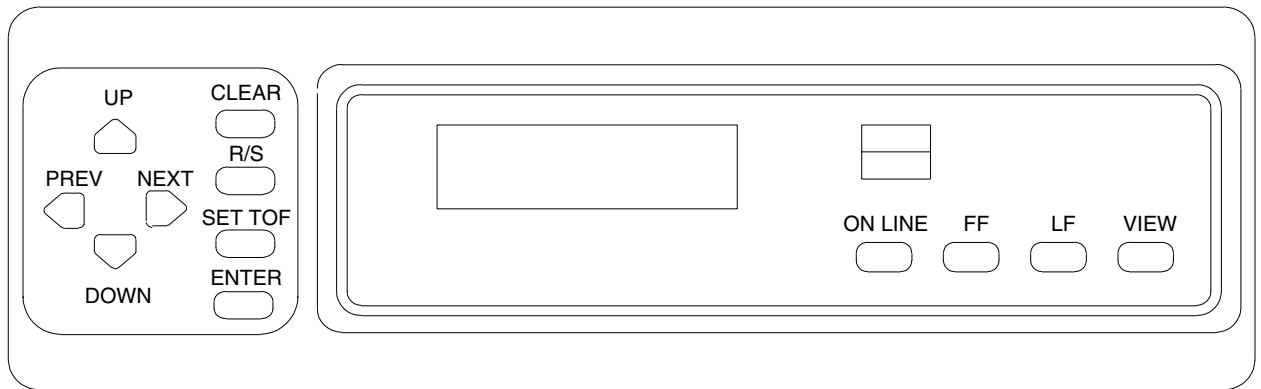
Figure 42. The Cabinet Control Panel
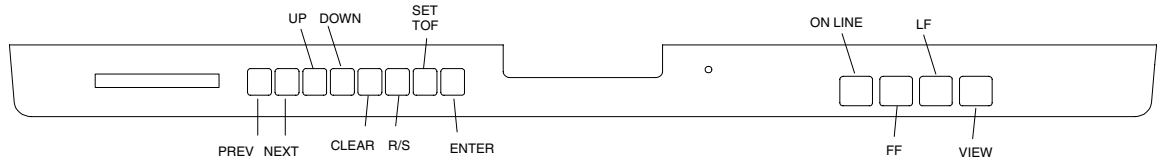
Figure 43. The Pedestal Control Panel

When you are navigating within the configuration menus (in offline mode), several of the control panel keys have specialized functions. They are described in the *Operator's Guide.*

Unlocking and Locking the ENTER Key

The ENTER key is locked by default, to prevent you from accidentally changing the printer configuration. You should generally unlock the ENTER key directly before you begin configuration using the menus; once the changes are made, relock the ENTER key to secure your new settings.

To unlock the ENTER key, place the printer in the offline mode and press UP and DOWN simultaneously. The following message will display briefly:

```
ENTER SWITCH
UNLOCKED
```

To lock the ENTER key, place the printer in offline mode and press UP and DOWN simultaneously. The following message will display briefly:

```
ENTER SWITCH
LOCKED
```

Factory Default Configuration Values

The factory default values are permanently stored in memory as a configuration. They cannot be modified or erased.

```
EMULATION LG
LG
Font
StyleDP 10 6
Character SetUS ASCII
Vert. Forms
Bot Frm66/6
Top Mrg0/6
Horiz. Forms
Left Mrg00.0
Right Mrg13.6
AutowrapNo
CR=CR
LF=LF
Unsolicited RptNo
Print Mode OptEnable
Plot Mode OptEnable
I-2/5 Guard BarsEnable
LinePrinter+
Printer Protocol
Proprinter
Define CR codeCR=CR
Auto LFEnable
Define LF codeLF = LF
FF Valid at TOFEnable
Character SetCode Page 437
Alt Char SetSet 1
20 CPI CondensedEnable
CPI/LPI Select
Select CPI10.0 CPI
Select LPI6.0 LPI
Font Attributes
TypefaceData Processing
Prop. SpacingDisable
Bold PrintDisable
```

```
Italic PrintDisable
Slashed ZeroDisable
Page Format
Margins
Left Margin0 columns
Right Margin0 columns
Bottom Margin0 lines
Perforation SkipDisable
Form Length
Abs. Length IN11.0 inches
Abs. Length MM279.4 mm
Function of lines66 lines
Form Width
Abs. Width IN13.6 inches
Abs. Width MM345.4 mm
Function of CPI136 characters

MAINT / MISC
Hex Dump ModeDisable
Power-up StateOnline
Display LanguageEnglish

HOST INTERFACE
Serial
Interface TypeRS-232
Data ProtocolXON/XOFF
Baud Rate9600 Baud
Word Length8
Stop Bits1
ParityNone
Data Term ReadyTrue
Request to SendTrue
Buffer Size8 Kbyte

PRINTER CONTROL
UnidirectionalDisable
PMD FaultEnable
Slow Paper SlewDisable
Power Saver Time15 min.

DIAGNOSTICS
Printer TestsShift Recycle
Test WidthFull Width
Paper Out Dots40 dots

RIBBONMINDER
Ribbon ActionDisable
Ribbon Size100 Yards¹
Ribbon Adjust0
Fault ActionNew Ribbon
```

[1] Default is 60 yards for pedestal models

Changing Parameters

A configuration consists of several parameters. The default factory configuration has a starting set of parameters. Your print jobs may require different parameter settings from the default that is provided. This section provides an example procedure for changing and saving individual parameter values.

Example

The following procedure shows how to change and save the settings for the Unidirectional option. Use these basic guidelines to navigate the configuration menus and change other parameters.

If you think the configuration for your printer has already been changed from the default, you should load the default configuration before starting this procedure (page 63).

* = Factory Default

```
┌──────────┐
│ OFFLINE  │
└────┬─────┘
     │
┌────┴─────┐          ┌──────────┐
│ CONFIG.  │  . . .   │ PRINTER  │
│ CONTROL  │          │ CONTROL  │
└──────────┘          └────┬─────┘
                           │
```

Unidirectional	PMD Fault	Slow Paper Slew	Power Saver Time
Disable* Enable	Enable* Disable	Disable* Enable	15* - 60 Min. Instant
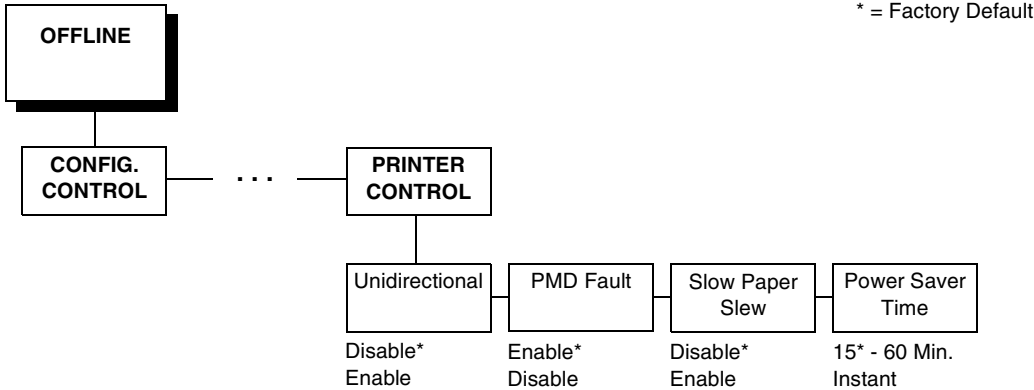
NOTE: Once you change active emulations, any changes to the previously selected emulation will be gone unless they have been saved.

Table 4. Parameter Change Example Procedure

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.	ONLINE	OFFLINE CONFIG. CONTROL	
3.	△ + ▽	ENTER SWITCH UNLOCKED OFFLINE CONFIG. CONTROL	Allows you to make configuration changes.

Table 4. Parameter Change Example Procedure (continued)

Step	Key	Result	Notes
4.	UNTIL	OFFLINE PRINTER CONTROL	
5.		PRINTER CONTROL Unidirectional	
6.		Unidirectional Disable*	
7.	OR	Unidirectional Enable	Cycle through the choices.
8.	ENTER	Unidirectional Enable*	An asterisk (*) indicates this choice is active.

TO SAVE YOUR CHANGES AS A CONFIGURATION THAT IS STORED IN MEMORY:

1.	UNTIL	OFFLINE PRINTER CONTROL	
2.	UNTIL	OFFLINE CONFIG. CONTROL	

3.   Go to the CONFIG. CONTROL submenu Save Config. option, as described on page 58, step 4.

TO USE THE CURRENT CONFIGURATION WITHOUT SAVING:

1.	+	ENTER SWITCH LOCKED	
2.	ONLINE	ONLINE	

3.   On cabinet models, close the printer cover. The printer is ready for operation. All parameters are effective as long as the printer is on. When you turn off the printer, the parameters will be erased from memory.

Saving Your New Configuration

* = Factory Default

```
┌─────────────┐
│  CONFIG.    │
│  CONTROL    │
└─────────────┘
       │
  ┌────┴──────┬───────────┬───────────┬───────────┬───────────┐
┌─────────┐ ┌─────────┐ ┌─────────┐ ┌─────────┐ ┌─────────┐ ┌─────────┐
│Load     │ │Save     │ │Print    │ │Delete   │ │Power-Up │ │Protect  │
│Config.  │ │Config.  │ │Config.  │ │Config.  │ │Config.  │ │Configs. │
└─────────┘ └─────────┘ └─────────┘ └─────────┘ └─────────┘ └─────────┘
                 1
                 2
                 3
                 4
                 5
                 6
                 7
                 8
```
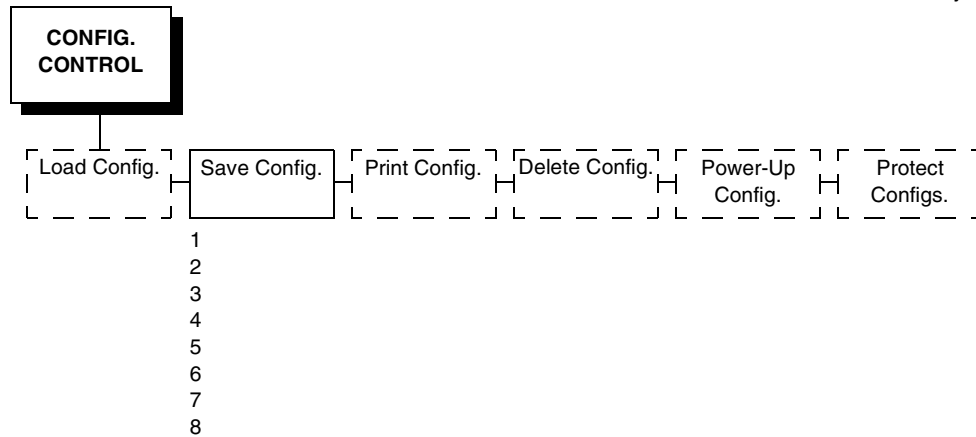
After changing all of the necessary parameters, it is recommended you save them as a configuration that can be stored and loaded later for future use. If you do not save your configuration before you power off the printer, all of your parameter changes will be erased. The Save Config. option allows you to save up to eight configurations to meet different print job requirements. Configurations 1 through 8 are empty until you save values to them using the Save Config. option. For example:
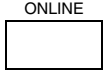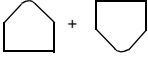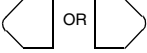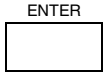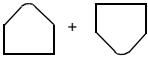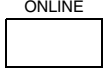
Config 1: Selects DP typeface, 10 cpi, 6 lpi
Config 2: Selects NLQ typeface, 12 cpi, 8 lpi

Once you have saved a configuration using this option, it will not be lost if you power off the printer. You can load a configuration for a specific print job (page 63). You can also modify and resave it. You may want to print your configurations and store them in a safe place, such as inside the printer cabinet.

NOTE: The Protect Configs. parameter must be set to disable before you may save a configuration. Once you save a configuration, the Protect Configs. parameter automatically returns to enable. Once you change active emulations, any changes to the previously selected emulation will be gone unless they have been saved.

Table 5. Saving Configurations

Step	Key	Result	Notes
1.	If you are already in the configuration menu, go to step 5.		
2.	ONLINE	OFFLINE CONFIG. CONTROL	
3.	+	ENTER SWITCH UNLOCKED	Allows you to make configuration changes.
		OFFLINE CONFIG. CONTROL	
4.		CONFIG. CONTROL Load Config.	
5.	UNTIL	CONFIG. CONTROL Save Config.	
6.		Save Config. 1*	
7.	OR	Save Config. 2	Press until the desired number (1-8) displays.

NOTE: Do not turn off the printer while save is in progress because you might lose your configuration.

8.	ENTER	Save Config. 2*	The configuration is now saved in memory. (In this case, config. 2.)
9.	UNTIL	CONFIG. CONTROL Save Config.	

NOTE: It is recommended you print the configuration. Go to page 62, step 5. If you decide not to print the configuration, then continue with the following steps.

10.	+	ENTER SWITCH LOCKED	Locks the ENTER key.
11.	ONLINE	ONLINE	
12.	Close the printer cover. The printer is ready for operation.		

Deleting Your Configuration

* = Factory Default

```
┌──────────────┐
│  CONFIG.     │
│  CONTROL     │
└──────────────┘
        │
 ┌──────┴────────────────────────────────────────────────────────────────┐
 │          │            │           │              │              │
Load Config.  Save Config.  Print Config.  Delete Config.  Power-Up    Protect
                                                            Config.     Configs.
                                          1*
                                          2
                                          3
                                          4
                                          5
                                          6
                                          7
                                          8
```
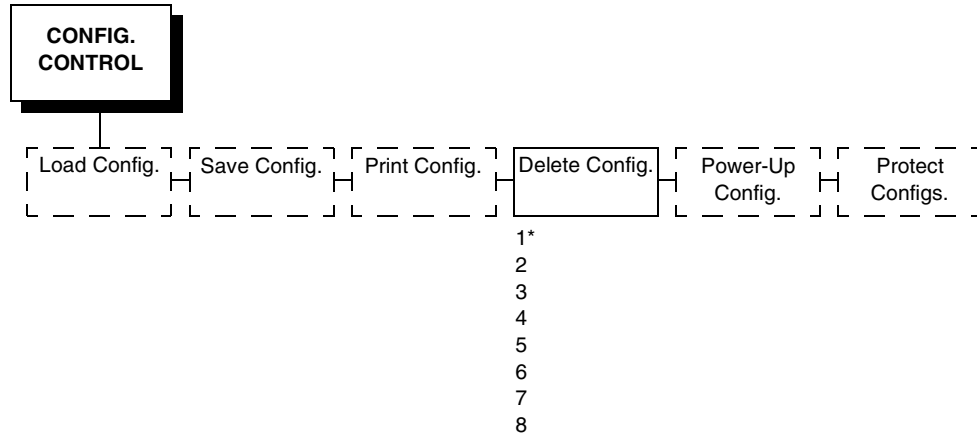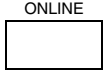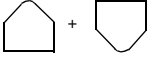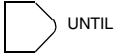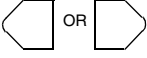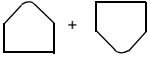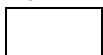
If you wish to delete a configuration from memory, select the appropriate configuration number from the menu and press ENTER.

The Protect Configs. parameter must be set to disable before you may delete a configuration. Once you delete a configuration the Protect Configs. parameter automatically returns to enable.

Table 6. Deleting Configurations

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.	ONLINE	OFFLINE CONFIG. CONTROL	
3.	△ + ⬠	ENTER SWITCH UNLOCKED	Allows you to make configuration changes.
		OFFLINE CONFIG. CONTROL	
4.	⬠	CONFIG. CONTROL Load Config.	
5.	⬠ UNTIL	CONFIG. CONTROL Delete Config.	
6.	⬠	Delete Config. 1*	
7.	⬠ OR ⬠	Delete Config. 3	Press until the desired number (1-8) displays.
8.	ENTER	Deleting Configuration	The printer has deleted the selected configuration.
		Delete Config. 3*	
9.	△ + ⬠	ENTER SWITCH LOCKED	Locks the ENTER key.
10.	ONLINE	ONLINE	
11.	Close the printer cover. The printer is ready for operation.		

Protecting Your Configurations

* = Factory Default

CONFIG. CONTROL

Load Config. — Save Config. — Print Config. — Delete Config. — Power-Up Config. — Protect Configs.
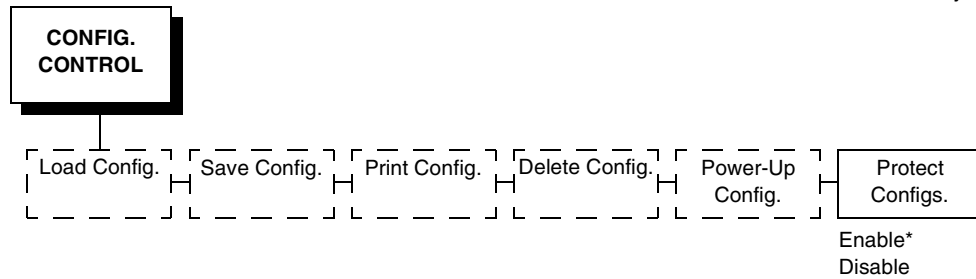
Enable*
Disable

In order to save or delete a configuration you must set the Protect Configs. option to disable. The Protect Configs. selection will automatically return to enable once a configuration is saved or deleted.

Printing the Current Configuration

* = Factory Default

CONFIG. CONTROL

Load Config. — Save Config. — Print Config. — Delete Config. — Power-Up Config. — Protect Configs.

Current*
Factory
Power-Up
All
1
2
3
4
5
6
7
8
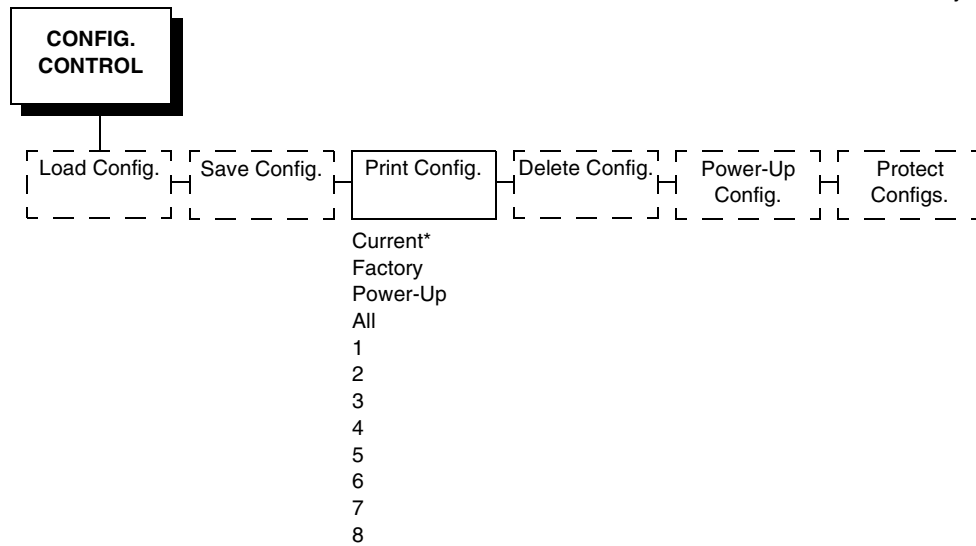
The configuration printout lists the stored parameters. You can print any or all of the configurations shown above. Configurations 1-8 are customized configurations.

To print a configuration, follow the procedure in Table 7.

Table 7. Printing Configurations

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.	ONLINE	OFFLINE CONFIG. CONTROL	
3.	+	ENTER SWITCH UNLOCKED OFFLINE CONFIG. CONTROL	Allows you to make configuration changes.
4.		CONFIG. CONTROL Load Config.	
5.	UNTIL	CONFIG. CONTROL Print Config.	
6.		Print Config. Current*	
7.	OR	Print Config. All	Press until the desired option displays.
8.	ENTER	OFFLINE CONFIG. CONTROL	The configuration listing begins printing.
9.	Carefully tear off the configuration printout.		
10.	+	ENTER SWITCH LOCKED	Locks the ENTER key.
11.	ONLINE	ONLINE	
12.	Close the printer cover. Store the printout in a safe place. The printer is ready for operation.		

Loading Configuration Values

* = Factory Default

```
┌─────────────┐
│  CONFIG.    │
│  CONTROL    │
└─────────────┘
       │
┌──────────┐ ┌──────────┐ ┌──────────┐ ┌───────────┐ ┌──────────┐ ┌──────────┐
│Load Config.│ │Save Config.│ │Print Config.│ │Delete Config.│ │ Power-Up │ │ Protect  │
│          │ │          │ │          │ │           │ │  Config. │ │ Configs. │
└──────────┘ └──────────┘ └──────────┘ └───────────┘ └──────────┘ └──────────┘
```

0*
1
2
3
4
5
6
7
8
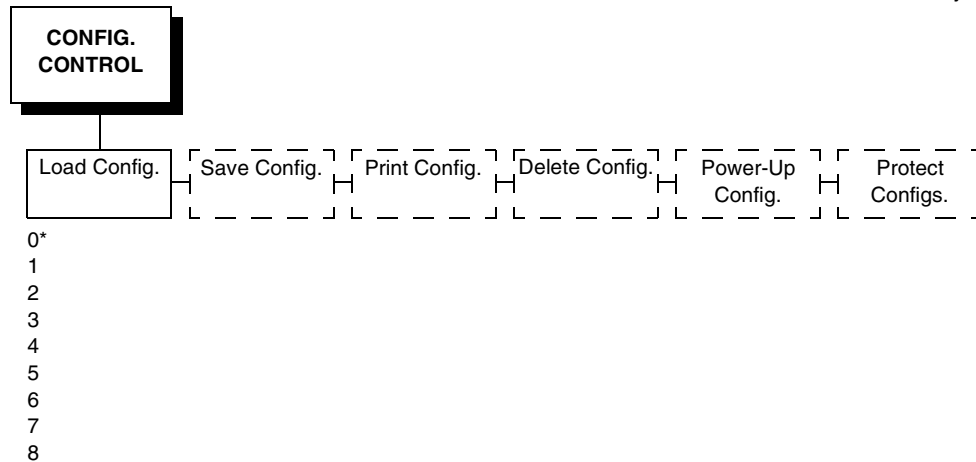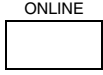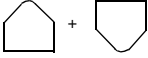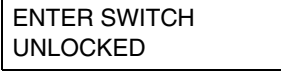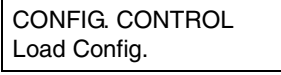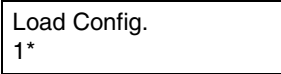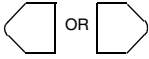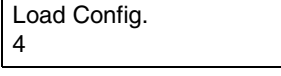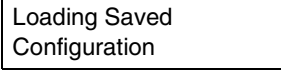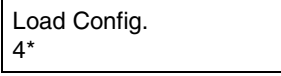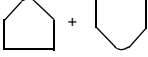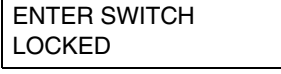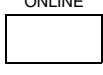
You can load any of the eight customized configurations or the factory default configuration.

The loaded configuration remains active as long as the printer is on. If you power off the printer, the power-up configuration will load.

"The Power-Up Configuration" on page 65 explains how to select the power-up configuration. If you do not set a power-up configuration, the factory default configuration will load if you power the printer off and then back on.

NOTE: A configuration must be saved before you can load it.

Table 8. Loading Configurations

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.	ONLINE	OFFLINE CONFIG. CONTROL	
3.	+	ENTER SWITCH UNLOCKED	Allows you to make configuration changes.
		OFFLINE CONFIG. CONTROL	
4.		CONFIG. CONTROL Load Config.	
5.		Load Config. 1*	
6.	OR	Load Config. 4	Press until the desired number (1-8) displays.
7.	ENTER	Loading Saved Configuration	Displays for about a second.
		Load Config. 4*	The printer has loaded the configuration.
8.	+	ENTER SWITCH LOCKED	Locks the ENTER key.
9.	ONLINE	ONLINE	
10.	Close the printer cover. The printer is ready for operation.		

The Power-Up Configuration

* = Factory Default

```
┌──────────────┐
│   CONFIG.    │
│   CONTROL    │
└──────────────┘
       │
  ┌────┴─────┬───────────┬───────────┬──────────────┬──────────────┬──────────────┐
┌─────────┐ ┌─────────┐ ┌─────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐
│Load Config.│ │Save Config.│ │Print Config.│ │Delete Config.│ │Power-Up  │ │ Protect  │
│         │ │         │ │         │ │          │ │Config.   │ │ Configs. │
└─────────┘ └─────────┘ └─────────┘ └──────────┘ └──────────┘ └──────────┘
                                                   0*
                                                   1
                                                   2
                                                   3
                                                   4
                                                   5
                                                   6
                                                   7
                                                   8
```
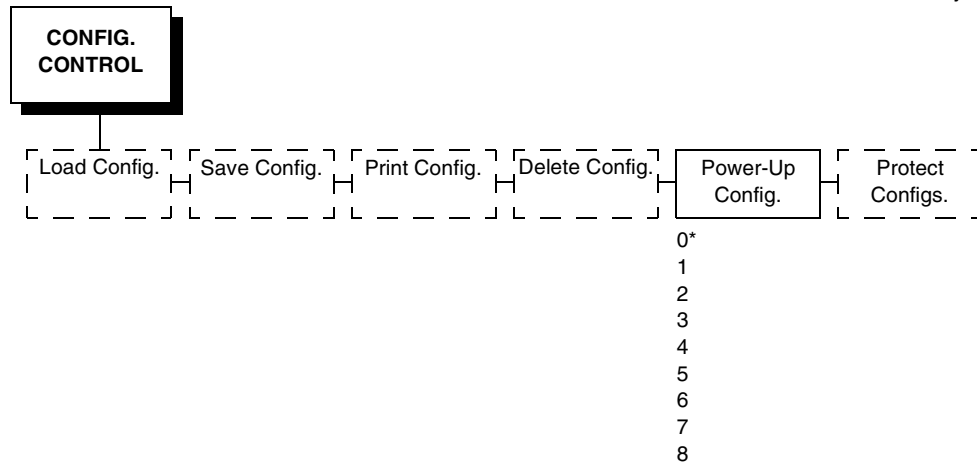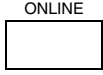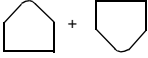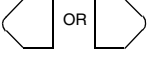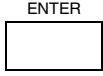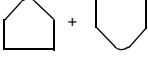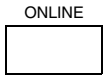
When you power on the printer for the first time, it loads configuration 0, the factory default configuration.

If you save a configuration, such as configuration 1, and turn the power off and then back on, the printer will load the designated power-up configuration, not the last saved configuration.

For your convenience, you can specify which configuration (0-8) should be the power-up configuration.

NOTE: When you change from the LG emulation to LinePrinter Plus (or from LinePrinter Plus to the LG emulation) as your active emulation, the power-up configuration is loaded for the new active emulation. (If no power-up configuration has been defined, the factory default configuration is loaded as the new active emulation.)

Table 9. Setting The Power-Up Configuration

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.	ONLINE	OFFLINE CONFIG. CONTROL	
3.	△ + ▽	ENTER SWITCH UNLOCKED	Allows you to make configuration changes.
		OFFLINE CONFIG. CONTROL	
4.	▽	CONFIG. CONTROL Load Config.	
5.	▷ UNTIL	CONFIG. CONTROL Power-Up Config.	
6.	▽	Power-Up Config. 0*	
7.	◁ OR ▷	Power-Up Config. 6	Press until the desired number (1-8) displays.
8.	ENTER	Power-Up Config. 6*	The printer has selected the desired configuration.
9.	△ + ▽	ENTER SWITCH LOCKED	Locks the ENTER key.
10.	ONLINE	ONLINE	
11.	Close the printer cover. The printer is ready for operation.		

4   *The Configuration Menus*

Overview

Once you have familiarized yourself with the configuration process using the tutorial information in Chapter 3, you are ready to complete your configuration of the printer. This chapter provides descriptions for each parameter. Figure 44 shows the main configuration menu.

Configuration Main Menu

Brief descriptions follow for the first-level configuration menu options:

- **CONFIG. CONTROL.** These options allow you to save, print, load, and delete entire sets of configuration parameters. These options are described briefly in this chapter and covered in detail in Chapter 3.

- **ACTIVE EMULATION.** This menu allows you to select either the LG (Digital) emulation or the LinePrinter Plus emulation as the current operating emulation for your printer. If the IGP/PGL or IGP/VGL optional upgrade is installed, then IGP/PGL & LP+ or IGP/VGL & LP+ can be selected as the active emulation.

- **EMULATION.** This menu allows you to configure the options available for the currently active emulation. For example, if LG is the active emulation, then the LG emulation options can be configured using this menu.

- **MAINT / MISC.** These options provide miscellaneous functions, such as printing a hex dump, selecting a display language, and choosing whether the printer will power up in the offline or online state.

- **HOST INTERFACE.** These options allow you to select either the Serial RS-232, Serial RS-422, Centronics parallel, Dataproducts parallel, or IEEE 1284 parallel interface for the printer (which must match the interface cabling you installed while setting up your printer, described in Chapter 2). This menu also allows you to configure several parameters for each interface.

- **PRINTER CONTROL.** These options allow you to select several operating parameters for the printer, such as the speed at which paper will advance when slewing.

- **DIAGNOSTICS.** These options include the diagnostic tests, system memory, and statistics of the printer.

- **RIBBONMINDER.** The options in this submenu allow you to enable the RibbonMinder™ feature and set its parameters.

```
        ┌──────────┐
        │ OFFLINE  │
        └────┬─────┘
             │
```

| CONFIG.
CONTROL
(see page 70) | ACTIVE IGP
EMULATION[1]
(see page 72) | EMULATION
(see page 73) | MAINT/MISC
(see page 102) |

Load Config.
  0* - 8
Save Config.
  1* - 8
Print Config.
  Current*
  Factory
  Power-Up
  All
  1 - 8
Delete Config.
  1* - 8
Power-Up Config.
  0* - 8
Protect Configs.
  Enable*
  Disable

LG*
LinePrinter+
IGP/PGL[1]
IGP/VGL[1]

LG*
LinePrinter+
IGP/PGL[1]
IGP/VGL[1]

Hex Dump Mode
  Disable*/Enable
Power-Up State
  Online*/Offline
Display Language
  English*
  German
  French
  Italian
  Spanish

NOTES:

[1] Choices available are limited to the emulations configured with the printer.

Figure 44. Configuration Menu Overview

HOST INTERFACE *(see page 103)*		PRINTER CONTROL *(see page 112)*	DIAGNOSTICS *(see page 114)*	RIBBON MINDER *(see page 117)*

Serial*
  Interface Type
    RS-232*/RS-422
  Data Protocol
    XON/XOFF*
    ETX/ACK
    ACK/NAK
    DTR
  Baud Rate
    600, 1200, 2400
    4800, 9600*,
    19200, 38400
    57600, 115200
  Word Length
    8* or 7
  Stop Bits
    1* or 2
  Parity
    None*, Odd
    Even, Mark
    Sense
  Data Term Ready
    True*
    On-Line and BNF
    Off-Line or BF
    False
  Request to Send
    True*
    On-Line and BNF
    Off-Line or BF
    False
  Buffer Size in K
    8* (1-16)

Parallel
  Centronics
    Data Bit 8
      Enable*/Disable
    Data Polarity
      Standard*/Inverted
    Strobe Polarity
      Standard*/Inverted
    Resp. Polarity
      Standard*/Inverted
    Busy On Strobe
      Enable*/Disable
    Latch Data On
      Leading*/Trailing
    Prime Signal
      Enable*/Disable
    TOF Action
      Reset*/Do Nothing
    Buffer Size in K
      8* (1-16)
  Dataproducts
    Data Bit 8
      Enable*/Disable
    PI Ignored
      Enable*/Disable
    Data Polarity
      Standard*/Inverted
    Data Request Pol.
      Standard*/Inverted
    Strobe Polarity
      Standard*/Inverted
    Buffer Size in K
      8* (1-16)
  Bidirectional
    Buffer Size in K
      8* (1-16)

Unidirectional
  Disable*
  Enable
PMD Fault
  Enable*
  Disable
Slow Paper Slew
  Disable*
  Enable
Power Saver Time
  15 min.*
  (15-60 min.)

Printer Tests
  Shift Recycle*
  All E's
  E's + TOF
  All H's
  All Underlines
  All Black
  Shuttle Slow
  Shuttle Fast
  Shuttle Only
  Phase Printer
  Paperout Adj.
  Burnin Test
  Print Error Log
  Clear Error Log
Test Width
  Full Width*
  80 col.
Paper Out Dots
  40 dots*
  (4-76 dots)
System Memory
  x Megabytes
Print Statistics
  On xx Hrs.
  Print xx Hrs.
  Print Strokes
  Print Lines
  11 Inch Pages

New Ribbon
Ribbon Action
  Disable*
  Display
  Fault
Ribbon Size
  100 yards*
  (1-255 yards)
Ribbon Adjust
  0*
  (-99% - 99%)
Fault Action
  New Ribbon*
  Do Nothing

To view options, press: ⇓ Down
⇑ Up
⇒ Next
⇐ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ONLINE.

* = Default Setting

Figure 44. Configuration Menu Overview (continued)

CONFIG. CONTROL

Menu

* = Factory Default

```
        CONFIG.
        CONTROL
```

Load Config.	Save Config.	Print Config.	Delete Config.	Power-Up Config.	Protect Configs.
0*	1*	Current*	1*	0*	Enable*
1	2	Factory	2	1	Disable
2	3	Power-Up	3	2	
3	4	All	4	3	
4	5	1	5	4	
5	6	2	6	5	
6	7	3	7	6	
7	8	4	8	7	
8		5		8	
		6			
		7			
		8			

```
To view options, press:  ⇓ Down
                         ⇑ Up
                         ⇒ Next
                         ⇐ Prev
To select an option, press ENTER.
To return to main menu, press
CLEAR.
To exit menu, press ONLINE.
* = Default Setting
```

The CONFIG. CONTROL menu manages configurations, which are groupings of parameter values that can be stored in printer memory. Brief descriptions follow for each option.

Load Config.

The printer can store any of nine configurations in memory. This parameter allows you to select and load a specific configuration.

Configuration 0 is the factory default; its parameters cannot be changed. It is always available for loading. See page 63 for a fuller description and sample procedure for using this option.

Save Config.

This option allows you to save up to eight unique configurations to meet different print job requirements. This eliminates the need to change the parameter settings for each new job.

The configurations are stored in memory, and will not be lost if you turn off the printer. Configuration 0 is a factory-preset configuration, which cannot be changed or saved. See page 55 for a fuller description and sample procedure.

The Protect Configs. parameter must be set to disable before you may save a configuration. Once you save a configuration, the Protect Configs. parameter automatically returns to enable.

Print Config.

This option is used to output a listing of various stored printer configurations. It is recommended you store the configuration printouts in a safe place for quick referral. See page 61 for a fuller description and sample procedure.

Delete Config.

You can delete one or all of your eight customized configurations. The Protect Configs. parameter must be set to disable before you may delete a configuration. Once you delete a configuration the Protect Configs. parameter automatically returns to enable. Configuration 0 is a factory-preset configuration and cannot be changed or deleted.

Power-Up Config.

You can specify which of the nine configurations (0-8) will be the power-up configuration. The factory default for power-up is configuration 0. See page 65 for a fuller description and sample procedure.

Protect Configs.

The default for this function is always enable. To save or delete a configuration, you must first set this option to disable. After saving or deleting a configuration, this option automatically returns to enable.

ACTIVE EMULATION
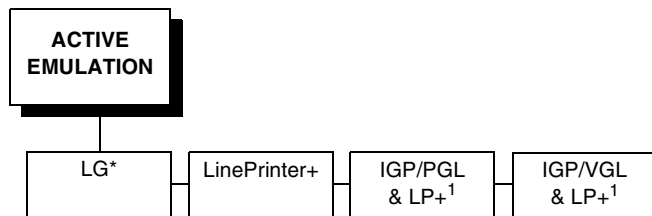
ACTIVE EMULATION

LG*	LinePrinter+	IGP/PGL & LP+[1]	IGP/VGL & LP+[1]

To view options, press: ⇩ Down
⇧ Up
⇨ Next
⇦ Prev
To select an option, press ENTER.
To return to main menu, press CLEAR.
To exit menu, press ONLINE.
* = Default Setting

[1] = if installed

The ACTIVE EMULATION menu allows you to select the emulation to be used with your DEC LG Emulation printer. Digital LG is the default active emulation. You can also select LinePrinter Plus as the active emulation. The Proprinter XL, Epson FX, and P-Series emulations are all part of LinePrinter Plus. You may configure options for the active emulation via the EMULATION menu, described on page 73.

If the IGP/PGL or IGP/VGL graphics upgrade option is installed, the display looks somewhat different, as follows:

- If IGP/PGL is installed, only the following option displays: "IGP/PGL & LP+"

- If IGP/VGL is installed, only the following option displays: "IGP/VGL & LP+"

NOTE: When you change from LG to LinePrinter Plus (or from LinePrinter Plus to LG) as your active emulation, the power-up configuration is loaded for the new active emulation. (If no power-up configuration has been defined, the factory default configuration is loaded.)

EMULATION
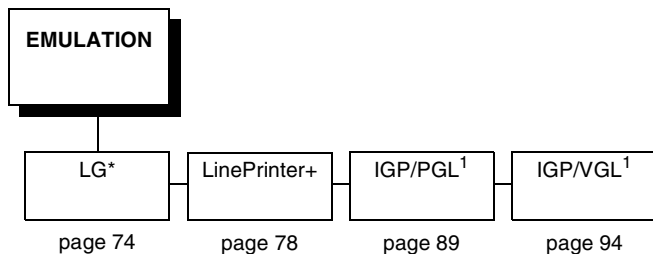
```
┌─────────────────┐
│ EMULATION       │
└─────────────────┘
         │
    ┌────┴────┬──────────────┬──────────────┐
┌───────┐ ┌────────────┐ ┌──────────┐ ┌──────────┐
│ LG*   │ │ LinePrinter+│ │ IGP/PGL¹ │ │ IGP/VGL¹ │
└───────┘ └────────────┘ └──────────┘ └──────────┘
 page 74    page 78        page 89       page 94
```

To view options, press: ⇓ Down

⇑ Up

⇒ Next

⇐ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ONLINE.

* = Default Setting

¹Optional Emulation

The EMULATION menu is the gateway to configuring the emulations available with the DEC LG Emulation.

NOTE: Only the emulation currently selected from the ACTIVE EMULATION menu can be selected and configured on the EMULATION menu.

• **LG**. If LG is the active emulation, then the options for this emulation can be selected and configured. The LG emulation is provided for compatibility with the Digital LG printer control language.

• **LinePrinter+**. If LinePrinter+ is the active emulation, the options for the following emulations can be selected and configured:

 • **Proprinter XL**. This LinePrinter+ emulation is provided for compatibility with the IBM Proprinter III XL printer control language.

 • **Epson FX**. This LinePrinter+ emulation is provided for compatibility with the Epson FX-1050 printer control language.

 • **P-Series**. This LinePrinter+ emulation is provided for compatibility with the Printronix P-Series printer control language.

• **IGP/PGL & LP+**. If you have installed the IGP/PGL optional upgrade, then the options for this emulation can be selected and configured. The IGP/PGL emulation is fully described in the *DEC LG Emulation IGP/PGL Programmer's Reference Manual*.

• **IGP/VGL & LP+**. If you have installed the IGP/VGL optional upgrade, then the options for this emulation can be selected and configured. The IGP/VGL emulation is fully described in the *DEC LG Emulation IGP/VGL Programmer's Reference Manual*.

Digital LG

Submenu

* = Factory Default

```
EMULATION
```
|
```
LG
```
|

Font	Vert. Forms	Horiz. Forms	Autowrap	CR	LF	Unsolicited Rpt
	Bot. Frm 66/6* (0-198) Top Mrg 0/6* (0-198)	Left Mrg 0.00* (0-13.1) Right Mrg 13.2* (0-13.2)	No* Yes	= CR* = CR + LF	= LF* = CR + LF	No* Small Big

Style	Character Set		Print Mode Opt	Plot Mode Opt	I-2/5 Guard Bars
			Enable* Disable	= LF* = CR + LF	Enable* Disable

Style	GL Char Set	GR Char Set
DP 10 6*	U.S. ASCII *	DEC Suppl.*
DP 10 8	DEC Finnish	DEC Technical
DP 12 6	French	VT100 Graphics
DP 12 8	DEC Fr. Can.	ISO Katakana
DP 15 6	German	ISO Latin 1
DP 15 8	Italian	ISO Latin 2
DP 15 10	JIS Roman	ISO Latin 5
HS 10 6	DEC Nor./Dan.	ISO Latin 9
CORESPON 5 6	Spanish	ISO Cyrillic
CORESPON 5 8	DEC Swedish	ISO Greek
CORESPON 6 6	DEC Great Brit.	ISO Hebrew
CORESPON 6 8	ISO Nor./Dan.	Hebrew Suppl.
CORESPON 10 6	DEC Dutch	Turkish Suppl.
CORESPON 10 8	DEC Swiss	
CORESPON 12 6	DEC Portuguese	
CORESPON 12 8	VT100 Graphics	
CORESPON 15 6	DEC Suppl.	
CORESPON 15 8	DEC Technical	
CORESPON 15 10	ISO Katakana	
OCR A	7-Bit Hebrew	
OCR B	7-Bit Turkish	
COMPRESS 6 6	Greek Suppl.	
COMPRESS 6 8	Hebrew Suppl.	
COMPRESS 8 6	Turkish Suppl.	
COMPRESS 8 8		
COMPRESS 13 6		
COMPRESS 13 8		
COMPRESS 13 10		
COMPRESS 16 6		
COMPRESS 16 8		
COMPRESS 16 10		
DP 5 6		
DP 5 8		
DP 6 6		
DP 6 8		

To view options, press: ⇓ Down
⇑ Up
⇒ Next
⇐ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ONLINE.

* = Default Setting

Font

Select a default font style and character set for the LG emulation, as follows:

- **Style**. This option allows you to specify a print quality that includes a characters per inch (cpi) and lines per inch (lpi) setting, in the format Type cpi lpi. The default setting is DP 10 6 (Data Processing, 10 cpi, 6 lpi). The print quality types you may choose from are as follows:

  DP = Data Processing (standard quality)
  CORESPON = Correspondence (near letter quality)
  COMPRESS = Compressed (vertically compressed for printing
       long graphs and charts)
  OCR A & OCR B = Optical Character Recognition, sets A and B
  HS = High Speed (Draft quality for high speed printing)

- **Character Set**. This option allows you to select a character set. The character set you select can be any of the Digital Multinational sets, which include the U.S. ASCII set and several foreign language and special character sets.

Vert. Forms

This option defines the bottom and top form margins.

- **Bot. Frm**. This option sets the bottom margin for the forms. You must specify the bottom margin in lines (at 6 lines per inch), ranging from 0 to 198 lines (33 inches). The default setting is 66. Press NEXT to increase the value, PREV to decrease the value, and ENTER to change units. Selecting a value for this option resets the top margin to 0, so the top margin must be redefined after this option is selected.

- **Top Mrg**. This option sets the top margin for the forms. You must specify the top margin in lines (at 6 lines per inch), ranging from 0 to 198 lines (33 inches). The default setting is 0. Press NEXT to increase the value, PREV to decrease the value, and ENTER to change units. The margins will automatically adjust so that the top and bottom margins do not cross each other.

Horiz. Forms

- **Left Mrg**. This sets the left margin for the forms. You must specify the left margin in 1/10 inch increments, from 0 to 13.1 inches. The default value is 0. Press NEXT to increase the value, PREV to decrease the value, and ENTER to change units. The margins will automatically adjust so that the left and right margins do not cross each other.

- **Right Mrg**. This sets the right margin for the forms. You must specify the right margin in 1/10 inch increments, from 0.1 to 13.2 inches. The default value is 13.2. Press NEXT to increase the value, PREV to decrease the value, and ENTER to change units. The margins will automatically adjust so that the left and right margins do not cross each other.

Autowrap

- **No**. The default. Any print data received past the forms width setting is discarded.

- **Yes**. An automatic carriage return and line feed is performed when data is received past the forms width setting.

CR (Carriage Return)

The CR option controls the action of the printer when it receives a Carriage Return code (hex 0D) from the host computer.

- **CR = CR**. The default. No line feed is added to a Carriage Return.

- **CR = CR + LF**. If this feature is enabled, each time the printer receives a Carriage Return, it inserts an additional Line Feed code (hex 0A) into the data stream. (Do not use this feature if the host computer sends Line Feeds to the printer with each Carriage Return.)

LF (Line Feed)

The LF option controls the action of the printer when it receives a Line Feed code (hex 0A) from the host computer.

- **LF = LF**. The default. No Carriage Return is added to a Line Feed.

- **LF = CR + LF**. Each time the printer receives a Line Feed, it inserts an additional Carriage Return code (hex 0D) into the data stream. This feature can be used in most installations, but it is required if the host computer does not send Carriage Returns to the printer.

Unsolicited Rpt.

This option enables or disables Printer Device Status Reports to be sent to the host when a reportable status or error condition has occurred. For further information on Device Status Reports, refer to the "Printer Status Requests and Reports" section in the Digital Emulation chapter of the *DEC LG Emulation LG Programmer's Reference Manual*.

NOTE: This option will work properly only if the printer has the serial interface selected, and the RTS option on the host interface serial menu is set to True (see page 104).

- **No**. The default. Disables all unsolicited status reports from the printer.

- **Small**. Enables brief unsolicited status reports and sends an extended status report to the host.

- **Big**. Enables extended, unsolicited status reports and sends an extended status report to the host.

Print Mode Opt

When enabled, this option affects the SPI, SHS, and DECSHORP commands. The printer will no longer be forced into these commands and print speed improves significantly when in portrait orientation. For SHS and DECSHORP, the character size will change with the selected pitch. In addition, SGR attributes such as bold, crossed-out, and italics, will be done in print mode with greater efficiency.

- **Enable**. The default. Enables the print mode option.

- **Disable**. Disables the print mode option. This provides compatibility with older LG printer products.

Plot Mode Opt

When enabled, this option will plot with greater efficiency, particularly with respect to the Postnet barcode. Postnet is printed in the same density as the current print mode font so that reverse motion will be inhibited when possible.

- **Enable**. The default. Enables the print mode option.

- **Disable**. Disables the print mode option. This provides compatibility with older LG printer products.

I-2/5 Guard Bars

- **Enable**. Horizontal guard bars are printed above and below each Interleaved 2/5 bar code. This option only applies to Interleaved 2/5 bar codes.

- **Disable**. Interleaved 2/5 bar codes are printed normally, with no guard bars.

LinePrinter+

* = Factory Default
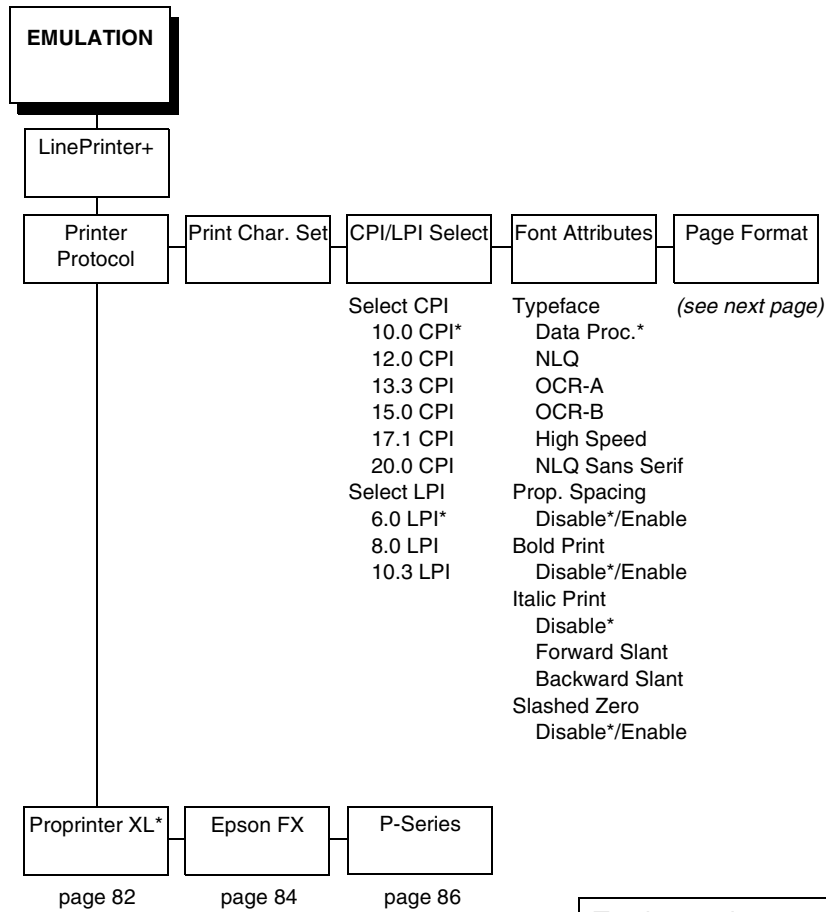
```
┌─────────────┐
│  EMULATION  │
└─────────────┘
       │
┌─────────────┐
│ LinePrinter+│
└─────────────┘
```

Printer Protocol	Print Char. Set	CPI/LPI Select	Font Attributes	Page Format

| | | | | *(see next page)* |

CPI/LPI Select:
```
Select CPI
   10.0 CPI*
   12.0 CPI
   13.3 CPI
   15.0 CPI
   17.1 CPI
   20.0 CPI
Select LPI
   6.0 LPI*
   8.0 LPI
   10.3 LPI
```

Font Attributes:
```
Typeface
   Data Proc.*
   NLQ
   OCR-A
   OCR-B
   High Speed
   NLQ Sans Serif
Prop. Spacing
   Disable*/Enable
Bold Print
   Disable*/Enable
Italic Print
   Disable*
   Forward Slant
   Backward Slant
Slashed Zero
   Disable*/Enable
```

Proprinter XL*	Epson FX	P-Series
page 82	page 84	page 86

To view options, press: ⇓ Down

⇑ Up

⇒ Next

⇐ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ONLINE.

* = Default Setting

* = Factory Default

```
┌─────────────────┐
│  Page Format    │
│  (from page 78) │
└─────────────────┘
```

Margins	Perforation Skip	Form Length	Form Width

Left Margin	Disable*	Abs. Length IN	Abs. Width IN
0* columns	1/2 inch	11.0* inches	13.6* inches
(0-369)	2/3 inch	(0.1-24)	(0.1-13.6)
Right Margin	5/6 inch	Abs. Length MM	Abs. Width MM
0* columns	1 inch	279.4* millimeters	345.4* millimeters
(0-369)		(0.1-609.6)	(0.1-345.4)
Bottom Margin		Funct. of Lines	Funct. of CPI
0* lines		66* lines	136* Characters
(0-451)		(1-192)	(1-272)

Printer Protocol

Select the LinePrinter+ protocol you wish to use. Refer to the *LinePrinter Plus Programmer's Reference Manual* for more information.

Print Char Set

When this selection is displayed and the ENTER key is pressed, the current character set is printed.

CPI/LPI Select

This parameter lets you specify the characters per inch (cpi) and lines per inch (lpi) values.

Font Attributes

Typefaces

- **Data Processing**. A general purpose font printing out at 120 dpi horizontally and 72 dpi vertically. The width of the font will vary with each cpi.

- **NLQ**. A high quality font printing at 180 dpi horizontally and 96 dpi vertically. This font has serifs and the width of the font varies with the cpi.

- **OCR-A / OCR-B**. Optical character recognition fonts printing at 120 dpi horizontally and 144 dpi vertically. Both fonts print only at 10 cpi.

- **High Speed**. A draft quality font printing at 120 dpi horizontally and 48 dpi vertically. The width of the font varies with the cpi.

- **NLQ Sans Serif**. A high quality font printing "at 180 dpi horizontally and 96 dpi vertically. This font prints without serifs. The width of the font varies with the cpi.

Proportional Spacing

Each printed character is contained inside a character cell. The width of the character cell includes the character and the space around the character.

- **Disable**. Each character cell is printed with the same width. Each column in the printed text will line up.

  ```
  This example is printed with
  proportional spacing disabled.
  ```

- **Enable**. The width of each character cell varies with the width of the character. For example, [i] takes less space to print than [m]. Using proportional fonts generally increases the readability of printed documents, giving text a typeset appearance.

  ```
  This example is printed with
  proportional spacing enabled.
  ```

Bold Print

- **Disable**. Text is printed normally.
- **Enable**. Text is printed with a heavy line thickness.

Italic Print

- **Disable**. Text is printed normally.
- **Forward Slant**. Text is printed with a forward slant.
- **Backward Slant**. Text is printed with a backward slant.

Slashed Zero

This parameter allows you to print the numeral "0" with or without the slash. This option applies to all character sets except OCR-A and OCR-B.

- **Disable**. Zero is printed without a slash.
- **Enable**. Zero is printed with a slash.

Page Format

Margins

- **Right Margin**. Set in columns. Column zero is defined as the far right edge of the page, and column numbering increments from right to left.

- **Left Margin**. Set in columns. Column zero is defined as the far left edge of the page, and column numbering increments from left to right.

- **Bottom Margin**. Defined in lines, starting from line zero at the bottom of the page and incrementing from the bottom up.

Perforation Skip

- **Disable**. Allows printing on page perforation.

- You may set up a skip-over margin of 1/2 inch, 2/3 inch, 5/6 inch, or 1 inch. For example, a skip-over margin of 1 inch allows a 1 inch margin at the bottom of the page.

Forms Length

Forms length is the number of lines that can be printed on a page. You can set forms length in inches, millimeters (mm) or as a function of the current LPI (lines per inch).

Forms Width

The forms width can be specified in inches, millimeters, or as a function of the current CPI (characters per inch). The forms width set should not exceed the actual paper width.

Proprinter XL Emulation

* = Factory Default

```
┌─────────────┐
│   Printer   │
│  Protocol   │
│(from page 78)│
└─────────────┘
       │
┌─────────────┐
│Proprinter XL│
└─────────────┘
       │
```

Define CR Code	Auto LF	Define LF Code	FF Valid at TOF	Character Set	Alt. Char Set	20 CPI Condensed
CR = CR* CR = CR + LF	Enable* Disable	LF = LF* LF = CR + LF	Enable* Disable	Code Page 437* Code Page 850 OCR-A OCR-B Code Page 210 Code Page 220 Code Page 852 Code Page 855 Code Page 857 Code Page 862 Code Page 866 Lithuanian 1 Lithuanian 2 Hebrew New Hebrew DEC Hebrew Old Latin 9 8859-15	Set 1* Set 2	Enable* Disable

Define CR Code

This option controls the action of the printer when it receives a Carriage Return code (hex 0D) from the host computer. If this feature is enabled, each time the printer receives a Carriage Return, it inserts an additional Line Feed code (hex 0A) into the data stream. Do not use this feature if the host computer sends Line Feeds to the printer.

• **CR = CR**. Does not insert an extra Line Feed after each Carriage Return.

• **CR = CR + LF**. Inserts an extra Line Feed after each Carriage Return.

Auto LF

This option defines the printer actions when print data is received past the forms width setting.

• **Enable**. Performs an automatic carriage return and line feed when data is received past the forms width.

• **Disable**. Discards any data past the forms width.

Define LF Code

- **LF = LF**. Does not perform an automatic carriage return when a line feed command is received. The next print position will be the current print position of the next line.

- **LF = CR + LF**. Forces an automatic carriage return with each line feed command received. The next print position is print position 1 of the next line.

FF Valid at TOF

- **Enable**. Performs a form feed when the host sends a Form Feed command and the printer is at the top of form.

- **Disable**. Will not perform a form feed when the host sends a Form Feed command and the printer is at the top of form.

Character Set

Specifies the active character set. To use one of these sets, choose the desired character set and press ENTER. The desired set will be starred to indicate your selection. Code Page 437 is the default.

Alternate Char Set

This option determines if data in the range of hex 80 through hex 9F should be interpreted as a control code or as a printable character.

- **Set 1**. Interprets data in the range of hex 80 through hex 9F as a control code.

- **Set 2**. Prints data for the characters at hex locations 03, 04, 05, 06, 15 and 80 through 9F.

20 CPI Condensed

Compressed print characters are narrower than the normal character set. This is helpful for applications where you need to print the maximum amount of information on a page.

- **Enable**. Prints characters about 60 percent the width of normal characters when compressed print is chosen by the host computer.

- **Disable**. Does not compress print widths, even if condensed print is chosen by the host.

Epson FX Emulation

* = Factory Default

```
┌─────────────────┐
│ Printer         │
│ Protocol        │
│ (from page 78)  │
└─────────────────┘
        │
┌─────────────────┐
│ Epson FX        │
└─────────────────┘
        │
```

Define CR Code	Auto LF	Define LF Code	Printer Select	Character Set	20 CPI Condensed	Alt. Set 80-9F
CR = CR*	Enable*	LF = LF*	Disable*	Epson Set*	Enable*	Control Code*
CR = CR + LF	Disable	LF = CR + LF	Enable	ASCII (USA)*	Disable	Printable
				French		
				German		
				English		
				Danish I		
				Swedish		
				Italian		
				Spanish I		
				Japanese		
				Norwegian		
				Danish II		
				Spanish II		
				Latin Am I		
				French Canadian		
				Latin Am II		
				OCR-A		
				OCR-B		
				Code Page 210		
				Code Page 220		
				Code Page 852		
				Code Page 855		
				Code Page 857		
				Code Page 862		
				Code Page 866		
				Lithuanian 1		
				Lithuanian 2		
				Hebrew Old		
				Hebrew New		
				Hebrew DEC		
				Latin 9 8859-15		
				IBM PC		

Define CR Code

The Define CR Code option controls the action of the printer when it receives a Carriage Return code (hex 0D) from the host computer. If this feature is enabled, each time the printer receives a Carriage Return, it inserts an additional Line Feed code (hex 0A) into the data stream. Do not use this feature if the host computer sends Line Feeds to the printer.

• **CR = CR**. Does not insert an extra Line Feed after each Carriage Return.

• **CR = CR + LF**. Inserts an extra Line Feed after each Carriage Return.

Auto LF

This option defines the printer actions when print data is received past the forms width setting.

- **Enable**. Performs an automatic carriage return and line feed when data is received past the forms width.

- **Disable**. Discards any data past the forms width.

Define LF Code

The Define LF Code option controls the action of the printer when it receives a Line Feed code (hex 0A) from the host computer. If this feature is enabled, each time the printer receives a Line Feed, it inserts an additional Carriage Return code (hex 0D) into the data stream. This feature is required if the host computer does not send Carriage Returns to the printer.

- **LF = LF**. Does not add a Carriage Return with a Line Feed.

- **LF = CR + LF**. Adds an extra Carriage Return with each Line Feed.

Printer Select

- **Disable**. Ignores the ASCII DC1 and DC3 control codes.

- **Enable**. Disables the printer when a DC1 control code is received, and enables the printer when a DC3 control code is received.

Character Set

This parameter selects a character set for the Epson emulation. Note that when OCR-A or OCR-B is selected as the print language, the Font Attribute Typeface option under the LinePrinter Plus menu ($\pi\alpha\gamma\epsilon$ 79) is changed to OCR-A or OCR-B, respectively. To use one of these sets, choose the desired character set and press ENTER. ASCII (USA) is the default.
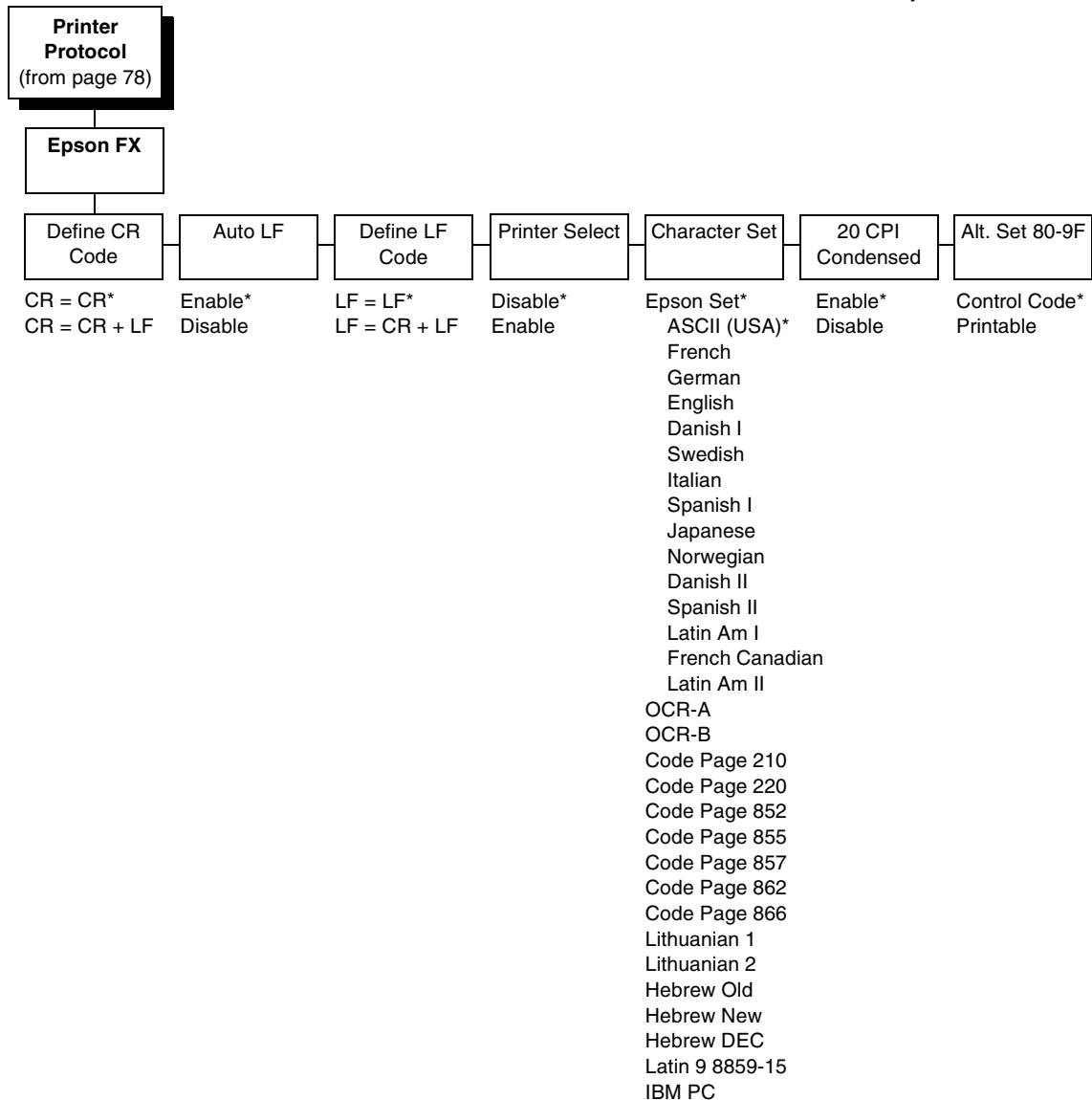
20 CPI Condensed

Compressed print characters are narrower than the normal character set. This is helpful for applications where you need to print the maximum amount of information on a page.

- **Enable**. Prints about 60 percent of the width of normal characters when compressed print is chosen by the host computer. For example, a 12 CPI Draft font will compress to 20 CPI.

- **Disable**. Does not compress print widths, even if condensed print is chosen by the host.

Alternate Set 80-9F

- **Control Code**. Interprets data in the range of hex 80 through hex 9F as a control code.

- **Printable**. Prints data in the range of hex 80 through hex 9F.

P-Series Emulation

* = Factory Default

Printer Protocol (from page 78)

P-Series

Control Code 06	Control Code 08	Define CR Code	Auto LF	Overstrike	Define LF Code
6.0 LPI	Elongated*	CR = CR*	Disable*	Enable*	LF = CR + LF*
8.0 LPI*	Backspace	CR = CR + LF	Enable	Disable	LF = LF
10.3 LPI					

Select SFCC	EVFU Select	Alt. Set 80-9F	Character Set	SFCC d Command
1*	Enable*	Control Code*		Even dot plot*
(00-7F hex)	Disable	Printable		Double High

IBM PC*		Multinational	ECMA Latin 1		DEC Multinational
Primary Subset	Extended Subset	ASCII (USA)*	Primary Subset	Extended Subset	ASCII (USA)*
ASCII (USA)*	Code Page 437*	EBCDIC	ASCII (USA)*	Multinational*	French
French	Code Page 850		German	Barcode 10 CPI	German
German			Swedish	Mult. DP 10 CPI	English
English			Danish	Mult. DP 12 CPI	Norweg./Danish
Danish			Norwegian	Mult. LQ 10 CPI	Swedish
Swedish			Finnish	Greek DP 10 CPI	Italian
Italian			English	Greek DP 12 CPI	Spanish
Spanish			Dutch	Greek LQ 10 CPI	Japanese
Japanese			French	Grap. DP 10 CPI	French Canadian
French Canadian			Spanish	Grap. LQ 10 CPI	Dutch
Latin American			Italian	Sci. DP 10 CPI	Finnish
Norwegian			Turkish	Sci. DP 12 CPI	Swiss
Danish II			Japanese	Sci. LQ 10 CPI	
Spanish II					
Latin Am II					

OCR-A	OCR-B	Latin 9 8859-15

Control Code 06

Control Code 06 defines the function of ASCII code hex 06 (ACK). You can select an alternate line spacing of 6, 8 or 10.3 LPI.

Control Code 08

Control Code 08 defines the function of ASCII code hex 08 (BS). You can define the code to output an elongated character or a backspace.

Define CR Code

This option controls the action of the printer when it receives a Carriage Return code (hex 0D) from the host computer. If this feature is enabled, each time the printer receives a Carriage Return, it inserts an additional Line Feed code (hex 0A) into the data stream. Do not use this feature if the host computer sends Line Feeds to the printer.

*   **CR = CR**. Does not insert an extra Line Feed after each Carriage Return.
*   **CR = CR + LF**. Inserts an extra Line Feed after each Carriage Return. The next print position will be print position 1 of the next line.

Auto LF

This option defines the printer action when print data is received past the forms width setting.

*   **Disable**. Discards any data past the forms width.
*   **Enable**. Performs an automatic carriage return and line feed when data is received past the forms width.

Overstrike

*   **Enable**. Common dots appear darker in characters printed over each other, as shown below. The print position moves one-half dot to the right. Overstrike printing occurs at a decreased speed.
*   **Disable**. If you are using a control code for overstrike, but it is disabled in the printer control panel, no bolding will occur.
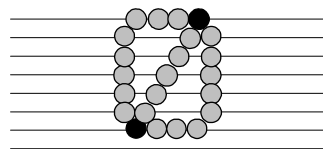
Define LF Code

*   **LF = CR + LF**. Forces an automatic carriage return with each line feed command. The next print position is print position 1 of the next line.
*   **LF = LF**. Does not perform an automatic carriage return. The next print position will be the current print position of the next line.

Select SFCC

This parameter allows you to select which ASCII codes will function as the Special Function Control Code (SFCC) command delimiter.
P-Series codes can use hex 00 through hex 7F. Options include the following:

- ESC (hex 1B)

- SOH (hex 01)

- ETX (hex 03)

- CIRCUMFLEX (hex 5E)—also called caret (^)

- TILDE (hex 7E)—(~)

NOTE: SOH, ETX and ESC are non-printables. The characters (^) and (~) are printable; however, do not use them as printables in the host data stream if either is chosen as a delimiter, or print errors will occur.

EVFU Select

Controls how the printer handles vertical formatting.

- **Enable**. Enables the VFU and selects P-Series compatible Electronic Vertical Format Unit (EVFU).

- **Disable**. Disables all VFU processing.

Alt. Set 80-9F

Determines whether the printer processes ASCII codes hex 80 through hex 9F as control codes or as printable characters.

Character Set

Specifies a character set. To use one of these sets, choose the desired set and press ENTER. Two groups of character sets (IBM PC and ECMA Latin 1) have Primary and Extended Subsets. To use one of these sets, choose the group name and press ENTER, then choose the desired set within the Primary or Extended subset and press ENTER. Both the group and the desired set will be starred to indicate your selection.
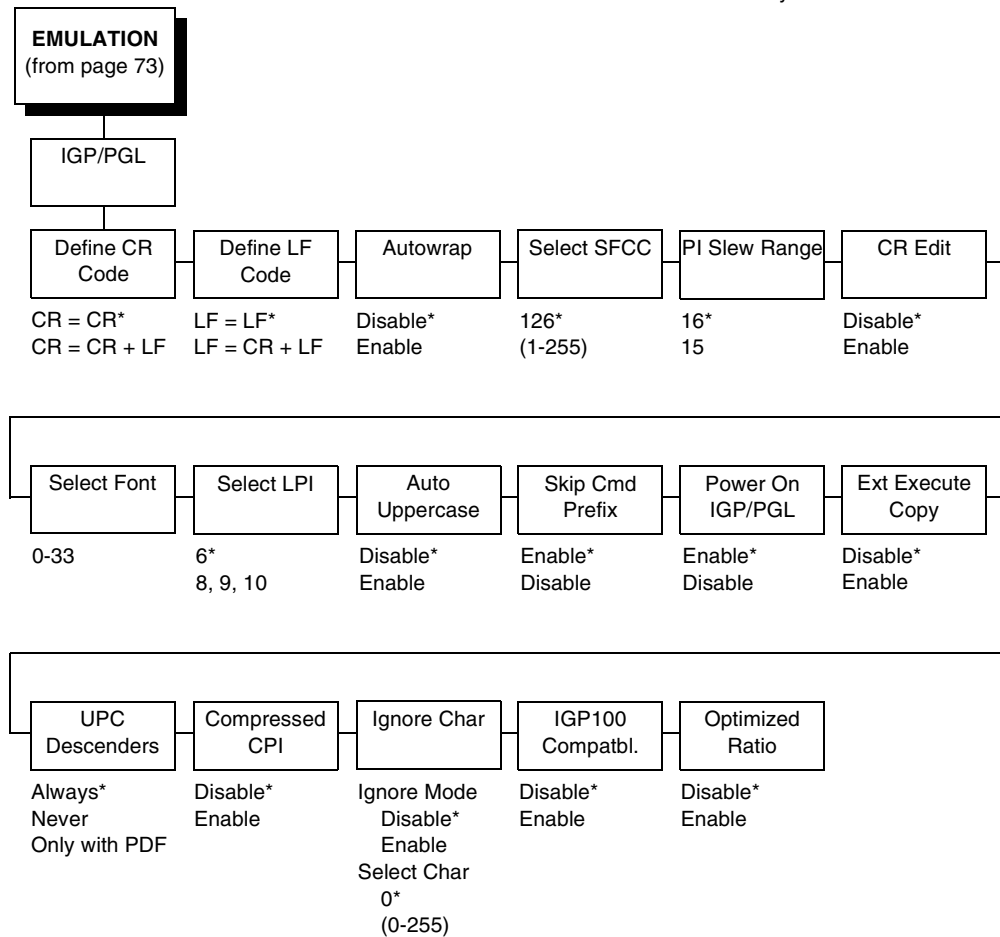
SFCC d Command

- **Even dot plot**. This option interprets SFCC d Command as even dot plot.

- **Double high**. This option interprets SFCC d Command as double high. Select this option for backward compatibility.

IGP/PGL Emulation

The IGP/PGL emulation can be configured either through the printer's front panel or from the host computer with control codes. For a detailed description of configuration with control codes, see the *DEC LG Emulation IGP/PGL Programmer's Reference Manual.* For information on configuring the emulation through the printer's front panel, see the submenu below and the parameter descriptions that follow.

Submenu

* = Factory Default

EMULATION
(from page 73)

IGP/PGL

Define CR Code	Define LF Code	Autowrap	Select SFCC	PI Slew Range	CR Edit
CR = CR*	LF = LF*	Disable*	126*	16*	Disable*
CR = CR + LF	LF = CR + LF	Enable	(1-255)	15	Enable

Select Font	Select LPI	Auto Uppercase	Skip Cmd Prefix	Power On IGP/PGL	Ext Execute Copy
0-33	6*	Disable*	Enable*	Enable*	Disable*
	8, 9, 10	Enable	Disable	Disable	Enable

UPC Descenders	Compressed CPI	Ignore Char	IGP100 Compatbl.	Optimized Ratio
Always*	Disable*	Ignore Mode	Disable*	Disable*
Never	Enable	Disable*	Enable	Enable
Only with PDF		Enable		
		Select Char		
		0*		
		(0-255)		

Define CR Code (Carriage Return)

This parameter forces the printer to insert an automatic Line Feed code into the data stream whenever a Carriage Return code occurs. This is to be used only if the host computer does not send Line Feeds to the printer.

- **CR = CR.** Does not perform a line feed. The next print position will be print position 1 of the current line.

- **CR = CR + LF.** Performs an automatic line feed. The next print position will be print position 1 of the next line.

Define LF Code (Line Feed)

This parameter forces the printer to insert an automatic Carriage Return code into the data stream whenever a Line Feed code occurs. This can be used in most installations, but it is required if the host computer does not send Carriage Returns to the printer.

- **LF = LF.** Does not perform an automatic carriage return. The next print position will be the current print position of the next line.

- **LF = CR + LF.** Performs an automatic carriage return. The next print position will be print position 1 of the next line.

Autowrap

This parameter determines if text will wrap to the next line when the line of text exceeds the right margin.

- **Disable.** Truncates the text beyond the right margin until a CR or CR + LF is received.

- **Enable.** Automatically inserts a CR + LF after a full print line.

Select SFCC

You can specify which decimal code (1-255) will be used as the Special Function Control Code (SFCC). The factory default setting is 126. The SFCC denotes that the following data is an IGP/PGL command.

PI Slew Range

You can specify how many lines the paper will feed.

- **15.** A paper slew of 1-15 will move 1-15 lines. A paper slew of 0 will move 1 line.

- **16.** A paper slew of 0-15 will move 1-16 lines.

CR Edit

This parameter determines if a carriage return will be followed by a line feed.

* **Disable**. The printer ignores all carriage returns that are not followed by line feeds.

* **Enable**. The printer processes all carriage returns, even for those that are not followed by line feeds.

Select Font

This parameter allows you to select a font for the IGP/PGL feature. The default is 0, which is U.S. ASCII. The following values are valid choices:

0	U.S. ASCII
1	German
2	Swedish
3	Danish
4	Norwegian
5	Finnish
6	English
7	Dutch
8	French
9	Spanish
10	Italian
11	Turkish
32	Code Page 437
33	Code Page 850

Values 12-23 are undefined and will default to 0. You can set values 24-31 to specific fonts; refer to the USET command in the *IGP/PGL Programmer's Reference Guide*.

Select LPI

This is the number of lines to be printed per inch. For example, at 6 lpi there is 1/6 inch from the top of one print line to the top of the next print line.

Auto Uppercase

This parameter enables the printer to print text in all uppercase when using the ALPHA command.

* **Disable**. The printer will print text in upper and lowercase.

* **Enable**. The printer will print text in uppercase only.

Skip Command Prefix

This parameter determines if the printer will print any data before an IGP/PGL command is received.

- **Enable**. The printer ignores all data on the current line before an IGP/PGL command.

- **Disable**. The printer will print all data on the current line before an IGP/PGL command.

Power On IGP/PGL

You can set the IGP/PGL feature so that it is enabled or disabled when the printer is powered on.

- **Enable**. The IGP/PGL is enabled when the printer is powered on. (The IGP/PGL feature is initialized in the Normal mode.)

- **Disable**. The IGP/PGL is disabled when the printer is powered on. (The IGP/PGL feature is initialized to the Quiet mode.)

Extended Execute Copy

- **Disable**. Dynamic data, overlay data, etc. are not allowed if the optional Form Count parameter (number of forms to print) is specified as part of the Execute command. (This setting is IGP-100 compatible.)

- **Enable**. Dynamic data, overlay data, etc. are allowed within a form in which the Form Count parameter is specified in the Execute command. In this case, the exact same form (with identical dynamic data, etc.) is printed for whatever the Form Count is. However, incremental data is not incremented since the page that is printing is exactly the same. Also, each form is printed on a separate page.

UPC Descenders

This parameter allows you to print bar code descenders when human readable data is not presented in the UPC/EAN bar codes.

- **Always**. UPC/EAN bar codes are printed with descenders, even if there is no human readable data.

- **Never**. UPC/EAN bar codes are printed without descenders if there is no human readable data.

- **Only with PDF**. UPC/EAN bar codes are printed with descenders only when the PDF command is presented.

Compressed CPI

- **Disable**. The IGP/PGL does not compress characters.

- **Enable**. The IGP/PGL compresses characters (60% shorter) for 17 or 20 CPI fonts instead of using the normal height character.

Ignore Character

Ignore Mode

This parameter instructs the IGP/PGL to ignore the character selected under the Select Character menu.

• **Disable**. The IGP/PGL does not ignore any characters.

• **Enable**. The IGP/PGL ignores the characters specified in the Select Character menu.

Select Character

Instructs the IGP/PGL which decimal character (0-255) to ignore from the host.

IGP100 Compatbl.

This option instructs the IGP/PGL to behave similar to the IGP-100 with respect to certain commands. All new users with new applications should select the "Disable" option. Selecting this mode insures the printer behaves as described in this manual.

• **Disable**. The IGP/PGL does not emulate the IGP-100 mode.

• **Enable**. The IGP/PGL emulates the IGP-100 version.

Optimized Ratio

This option selects different bar code ratios for certain bar codes including Code 39 and Interleaved 2 of 5. It is included for compatibility with the IGP-100 printers.

• **Disable**. Use standard bar code ratios.

• **Enable**. Select the alternate bar code ratios.

IGP/VGL Emulation

The IGP/VGL emulation can be configured either through the printer's front panel or from the host computer with control codes. For a detailed description of configuration with control codes, see the *IGP/VGL Programmer's Reference Manual.* For information on configuring the emulation through the printer's front panel, see the submenu below and the parameter descriptions that follow.

Submenu

* = Factory Default

```
EMULATION
(from page 73)
        │
        │
     IGP/VGL
        │
```

SFCC & Pwrup	LPI	Graphics Options	Error Handling	Ignore/DB8 Setup
SFCC 94* (17-255)	6*	*(see next page)*	Error Msgs	Ignore Chars
Power Up ^X	7, 8, 9, 10		Enable*	Disable*
Disable*			Disable	Char 1
Enable			Error Markers	Char 2
Power Up ^F			Enable*	Char 1 & 2
Disable*			Disable	Ignore Ch#1
Enable			Offpage Errors	0* (0-255)
Power Up ^PY			Disable*	Ignore Ch#2
Disable*			Enable	0* (0-255)
Enable			Barcode Errors	Data Bit 8
			Enable*	Enable*/Disable
			Disable	

Font Set	PI Control
0-33	Printer PI
	Disable*
	Enable
	Host PI
	Disable*
	Enable
	Max PI 16
	Enable*
	Disable

* = Factory Default

Graphics Options (from page 94)

Slash 0	Ignore Dots	Append Rotated	Truncate Alpha	True Vert 1/10	Absorb After ^PY
Disable* Enable	Disable* Enable	Disable* Enable	Enable* Disable	Disable* Enable	Absorb Motion* Absorb All Disable

UPC Descenders	Rot. Char Size	Ignore Spaces	Midline PY	Dark Barcode	Width Limit
Enable* Disable	Adjusted* Not Adjusted	Disable* Enable	Disable* Enable	Disable* Enable	Disable* Enable

Absorb After ^PN	IGP 110 Compatbl.
Disable* Enable	Disable* Enable

SFCC & Pwrup

This option has several suboptions which define the SFCC and power-up configuration used with IGP/VGL.

SFCC

This option selects the Special Function Control Code. The default value is the caret ^ (decimal 94). Valid values are 17 through 255. Throughout this section, the ^ is used as the SFCC. Run a configuration printout to determine the currently selected SFCC.

Power Up ^X

- **Disable**. The default.
- **Enable**. Selects the ignore mode as the power-up default, and selects the graphics mode ^PY as the power-up default. All characters are ignored until a ^A command is received.

Power Up ^F

- **Disable**. The default.

- **Enable**. Selects free format mode as the power-up default, and selects the graphics mode ^PY as the power-up default. Free format causes the IGP/VGL to ignore carriage returns, line feeds and all characters below hex 20 sent from the host.

Power Up ^PY

- **Disable**. The default.

- **Enable**. Selects the graphics mode ^PY as the power-up default.

LPI

The number of lines to be printed per inch. For example, at 6 lpi there is 1/6 inch from the top of one print line to the top of the next print line.

Graphics Options

Following are several options which configure printing output.

Slash 0

This parameter allows you to print the numeral "0" with or without the slash. This option applies to all character sets except OCR-A and OCR-B.

- **Disable**. Zero is printed without a slash.

- **Enable**. Zero is printed with a slash.

Ignore Dots

- **Disable**. The default.

- **Enable**. Causes the IGP/VGL to expect position values to be specified in only 1/10ths of an inch. If the dot position is also given, it is treated as text.

Append Rotated

- **Disable**. Logos and alphanumeric strings are treated as separate elements.

- **Enable**. Appends logos to an alphanumeric string rotated in a clockwise, counterclockwise, or inverted orientation.

Truncate Alpha

When enabled, this parameter prevents the printing of Error 48 (Element Off Page Error) if alphanumeric data, including spaces, extends beyond the right side of the form.

True Vert 1/10

- **Enable**. A vertical 1/10 of an inch parameter is used as 1/10 of an inch. Rounding occurs to the nearest 1/72 of an inch. This can cause vertical moves that have the same value to differ by $\pm$ 1/72 of an inch.

- **Disable**. A vertical 1/10 of an inch parameter is used as 7/72 of an inch. The absolute move is slightly smaller than expected. For example, a one inch move would be 70/72 of an inch. Vertical moves that have the same value will be identical in length.

Absorb after ^PY

- **Absorb Motion**. Prevents paper motion following a system terminator in a graphics ^PY command.

- **Absorb All**. The system ignores all the data and terminator until a host generated terminator is detected.

- **Disable.** System terminators following a graphics command are sent to the printer and result in paper motion.

UPC Descenders

- **Enable**. UPC/EAN bar codes are printed with descenders, even if there is no human readable data.

- **Disable**. UPC/EAN bar codes are printed without descenders if there is no human readable data.

Rot. Char Size

- **Adjusted**. Rotated (clockwise/counterclockwise), expanded characters have a different size than an unrotated character with the same size parameters.

- **Not Adjusted**. Rotated, expanded characters will be the same size as unrotated characters with the same size parameters.

Ignore Spaces

- **Disable**. Trailing spaces are not deleted from alphanumeric elements in a graphics pass.

- **Enable**. Trailing spaces are deleted from alphanumeric elements in a graphics pass.

Midline PY (includes ^PN)

- **Disable**. The Graphics mode Enable command, ^PY, must be the first three characters of a line.

- **Enable**. The ^PY or ^PN can occur anywhere in a line.

Dark Barcode

- **Disable**. Dark mode printing will only occur if the dark mode command is sent before the bar code command.

- **Enable**. Bar codes will be printed in dark mode no matter what the dark mode is set for.

Width Limit

When enabled, the system will limit the length and width for expanded characters to a limit shown in Table 10, which shows the maximum width allowed for a specific height in the range of 00 through 40 (0.0 through 4.0 inches).

Table 10. Width Limit

Height Parameter	Max. Width Allowed	Height Parameter	Max. Width Allowed
00	99	21	51
01	99	22	53
02	3	23	56
03	6	24	58
04	8	25	61
05	11	26	63
06	13	27	66
07	16	28	68
08	18	29	71
09	21	30	73
10	23	31	76
11	26	32	78
12	28	33	81
13	31	34	83
14	33	35	86
15	36	36	88
16	38	37	91
17	41	38	93
18	43	39	96
19	46	40	98
20	48		

Absorb After ^PN

- **Disable**. All line terminators that immediately follow the ^PN command are sent to the printer and processed.

- **Enable**. All line terminators that immediately follow the ^PN command are ignored.

IGP 110 Compatbl.

This option instructs the IGP/VGL to behave similar to the IGP-110 with respect to certain commands. All new users with new applications should select the "Disable" option. Selecting this mode insures the printer will behave as described in this manual.

- **Disable**. The IGP/VGL does not emulate the IGP-110 mode.

- **Enable**. The IGP/VGL emulates the IGP-110 version.

Error Handling

Following are several options which define how errors are reported.

Error msgs

- **Enable**. Command syntax is checked and error messages printed when command parameters are incorrect.

- **Disable**. Error checking and error messages are suppressed.

Error markers

- **Enable**. Prints the following error markers for those elements that print beyond the page boundaries:

  >> for elements that begin off the right side of the page;

  << for elements that begin at the indicated position but end off the page;

  ♦ for elements where the starting position of the command contains an error other than an off-page error.

Offpage Errors

- **Disable**. Does not report errors for elements that start or end beyond the right edge of the page.

- **Enable**. Reports errors for elements that start or end beyond the right edge of the page.

Barcode Errors

- **Enable**. An error message will print when invalid bar code data is encountered.

- **Disable**. IGP/VGL will not print an error for illegal bar code data; the bar code will be skipped.

NOTE: When Barcode Errors is disabled, the IGP/VGL emulation will try to make the best use of invalid data by either truncating extra digits or adding zeros to the end of bar code data to meet minimum data length requirements for some bar codes. Not all errors will be corrected.

Ignore / DB8 Setup

Following are several options which define character filtering and data bit 8.

Ignore Chars

- **Disable**. Character filtering is not enabled.

- **Char 1**. Character 1 will be filtered. Select the option "Ignore ch#1" to specify character 1.

- **Char 2**. Character 2 will be filtered. Select the option "Ignore ch#2" to specify character 2.

- **Char 1&2**. Characters 1 & 2 will be filtered. Select the options "Ignore ch#1" and "Ignore ch#2" to specify values for these characters.

Ignore ch#1

Specifies character 1 for the character filtering option. Valid decimal values are from 0 through 255.

Ignore ch#2

Specifies character 2 for the character filtering option. Valid decimal values are from 0 through 255.

Data Bit 8

- **Enable**. The PI line is not passed directly from host to printer; all 8 bits are used for data bits, and characters in the hex 80-FF range can be accessed.

- **Disable**. When the host PI line is enabled, data bit 8 internally indicates PI line status. To use the PI line, disable data bit 8, and enable the Host PI configuration option (under the PI Control option, below).

NOTE: Data bit 8 is interpreted as either data bit 8 or PI signal, but never both. When enabled as data bit 8, data bit 8 has priority over the PI signal, and all data above hex 7F is used to access character data and not to interpret PI line data.

Conversely, when data bit 8 is disabled and the PI signal is used, data bit 8 of the data is reserved for use as the PI function, and you cannot access characters in the hex 80-FF range. Therefore, to access characters in the hex 80-FF range, data bit 8 must be enabled.

Font Set

This parameter allows you to select a font for the IGP/VGL feature. The default is 0, which is U.S. ASCII. The following values are valid choices:

0	U.S. ASCII
1	German
2	Swedish
3	Danish
4	Norwegian
5	Finnish
6	English
7	Dutch
8	French
9	Spanish
10	Italian
11	Turkish
32	Code Page 437
33	Code Page 850

Values 12-23 are undefined and will default to 0. You can set values 24-31 to specific fonts; refer to the User Set command in the *IGP/VGL Programmer's Reference Guide*.

PI Control

Printer PI

- **Disable**. The ASCII emulation is configured with the PI line disabled.

- **Enable**. The ASCII emulation is configured with the PI line enabled.

Host PI

- **Disable**. The host does not send PI signals.

- **Enable**. The host sends PI signals. The Data Bit 8 configuration option must be disabled to transmit the PI line to the printer.

Max PI 16

- **Enable**. A paper slew of 0-15 will move 1-16 lines.

- **Disable**. A paper slew of 1-15 will move 1-15 lines. A paper slew of 0 will always move 1 line.

MAINT / MISC

Menu

```
┌─────────────┐
│ MAINT/MISC  │
└─────────────┘
```

```
┌──────────┐  ┌──────────┐  ┌──────────┐
│ Hex Dump │  │ Power-up │  │ Display  │
│   Mode   │  │  State   │  │ Language │
└──────────┘  └──────────┘  └──────────┘
```

Disable*   Online*   English*
Enable   Offline   German
                            French
                            Italian
                            Spanish

```
┌────────────────────────────────────────┐
│ To view options, press:  ⇓ Down         │
│                          ⇑ Up           │
│                          ⇒ Next         │
│                          ⇐ Prev         │
│ To select an option, press ENTER.       │
│ To return to main menu, press           │
│ CLEAR.                                   │
│ To exit menu, press ONLINE.             │
│ * = Default Setting                      │
└────────────────────────────────────────┘
```
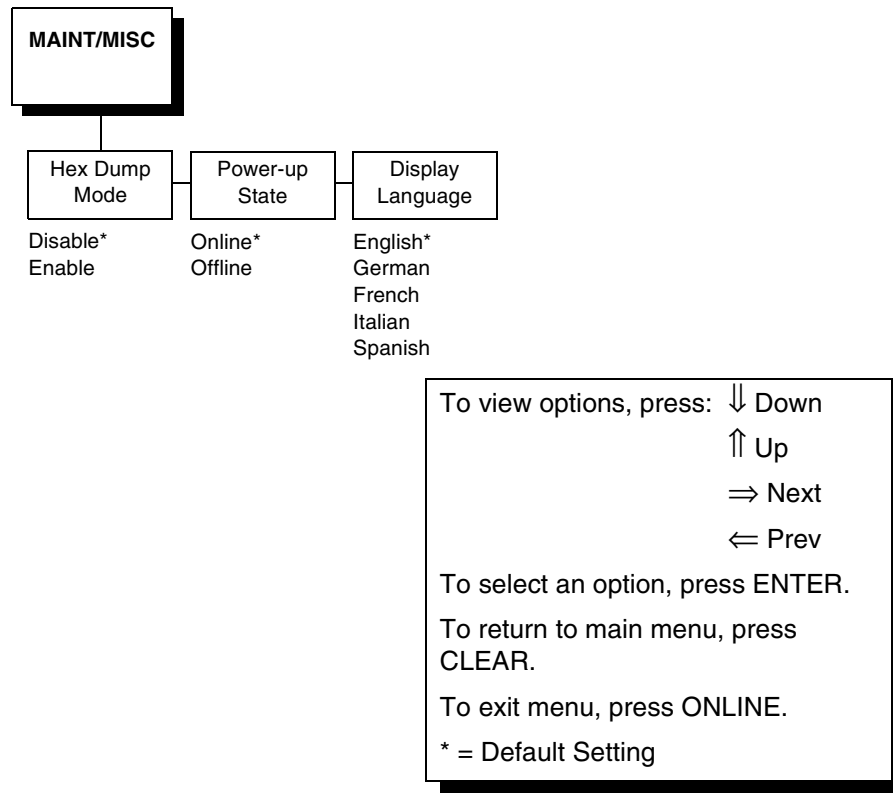
The MAINT / MISC menu allows the you to perform miscellaneous functions, such as printing a hex dump, selecting a display language, and choosing whether the printer will power up in the offline or online state.

Hex Dump Mode

A hex code printout (or hex dump) translates all incoming data to hexadecimal equivalents. A hex dump lists each ASCII data character received from the host computer, together with its corresponding two-digit hexadecimal code. Hex dumps can be used to troubleshoot some types of printer data reception problems. Figure 47 on page 140 shows a hex dump sample. Disable is the default.

Power-Up State

*   **Online.** The printer powers up in the online state.
*   **Offline.** The printer powers up in the offline state.

Display Language

This parameter chooses the language that will appear on the LCD: English (the default), German, French, Spanish, and Italian.

HOST INTERFACE

IMPORTANT   **The printer will not print unless the type of interface selected from the Host Interface Menu matches the type of interface in your host computer. The interface in your host computer is the one that connects to the data cable of the printer. For example, if the interface in your computer is a serial interface, then the serial interface must be selected from the Host Interface Menu in the printer.**
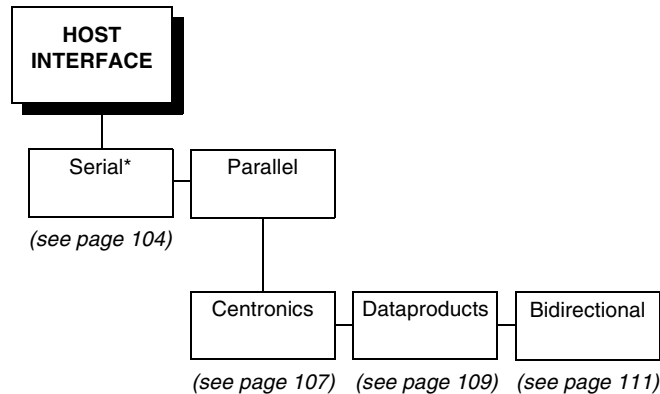
```
                      ┌──────────────┐
                      │    HOST      │
                      │  INTERFACE   │
                      └──────────────┘
                         │
              ┌──────────────┬──────────────┐
              │   Serial*    │   Parallel   │
              └──────────────┴──────────────┘
              (see page 104)          │
                          ┌────────────┬──────────────┬──────────────┐
                          │ Centronics │ Dataproducts │ Bidirectional│
                          └────────────┴──────────────┴──────────────┘
                          (see page 107)  (see page 109)  (see page 111)
```

```
┌─────────────────────────────────────┐
│ To view options, press:  ⇓ Down      │
│                          ⇑ Up        │
│                          ⇒ Next      │
│                          ⇐ Prev      │
│ To select an option, press ENTER.    │
│ To return to main menu, press        │
│ CLEAR.                               │
│ To exit menu, press ONLINE.          │
│ * = Default Setting                  │
└─────────────────────────────────────┘
```

The Host Interface Menu enables you to select and configure one of these types of interfaces between the printer and your host computer:

- Serial RS-232 (factory default) / Serial RS-422
- Centronics Parallel
- Dataproducts Parallel
- IEEE-1284 Bidirectional Parallel

The currently selected interface is indicated with an asterisk on the control panel message display. Each interface has its own submenu, with the set of associated interface parameters that you may configure. The host interface and its associated parameters control the interface between the printer and your host computer. Diagrams and descriptions follow for each of the host interface submenus.

Serial Submenu

IMPORTANT **The serial parameters in the printer must be set the same as the serial interface in the host computer. Otherwise, the printer might not work online, and data characters from the computer might not print or might print as "garbled" text.**

* = Factory Default

Serial (from page 103)

Interface Type	Data Protocol	Baud Rate	Word Length	Stop Bits	Parity
RS-232*	XON/XOFF*	600	8*	1*	None*
RS-422	ETX/ACK	1200	7	2	Odd
	ACK/NAK	2400			Even
	DTR	4800			Mark
		9600*			Sense
		19200			
		38400			
		57600			
		115200			

Data Term Ready	Request To Send	Buffer Size in K
True*	True*	8*
Online and BNF	Online and BNF	(1-16)
Offline or BF	Offline or BF	
False	False	
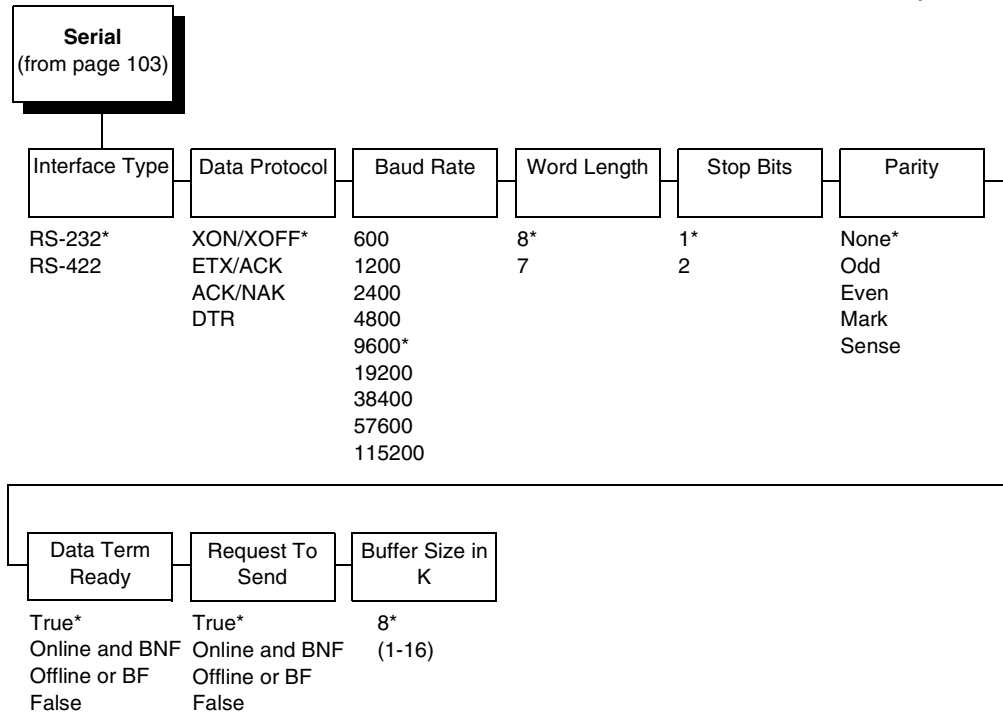
The serial submenu allows you to choose the configuration of the Serial host interface type, as shown above. Several other serial parameters are included on this menu, as shown below and described in the following pages.

Interface Type

Allows you to select either the RS-232 (the default) or RS-422 serial port interface.

Data Protocol

You can select one of the following serial interface protocols to meet the host interface requirements.

• **XON / XOFF.** The default. The printer controls the flow of communication from the host by turning the transmission on and off.

In some situations, such as when the buffer is full or the timing of signals is too slow or too fast, the printer will tell the host to stop transmission by sending an XOFF character.

An XOFF character is sent when the number of empty bytes in the buffer is less than or equal to 25 percent of the buffer size.

If the host keeps sending data after an XOFF is sent, the printer firmware will continue to send an XOFF for every 16 characters received.

When cleared, the printer will resume receiving data (XON). The data does not have any End of Text codes; XON / XOFF is a non-block protocol.

- **ETX / ACK.** End of Text / Acknowledge. The host controls the flow of communication to the printer by sending a block of data and ending the block with an End of Text (ETX) signal. When the printer receives the ETX signal, it will acknowledge the ETX, thereby acknowledging it has received the entire block of data.

- **ACK / NAK.** ACK means acknowledge; the device acknowledges it has accepted a transmission. NAK means a negative acknowledge; the device did not receive the transmission.

- **DTR.** Data Terminal Ready. The printer controls the data flow by sending this hardware signal to the host. If there is enough room in the printer buffer, the printer will send a high signal; if the buffer is full the printer will send a low signal. DTR tells the host if it is safe to send more data. If the host sends data during an unsafe condition, data will be lost.

Baud Rate

Sets the baud rate of the serial interface in the printer. Baud rate is the speed at which serial data is transferred between the host computer and the printer. The choices for the RS-232 and RS-422 interfaces are 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115K Baud. The default is 9600 baud.

NOTE: If you select a baud rate that is 19200 or greater, you may need to increase the Buffer Size in K parameter from the default (8 Kbyte), to improve performance.

Word Length

Sets the length of the serial data word. The length of the data word can be set to 7 or 8 bits, and must match the corresponding data bits setting in the host computer. The default is 8 bits.

Stop Bits

Sets the number of stop bits in the serial data word. Either one or two stop bits can be selected. The setting must match the corresponding stop bit setting in the host computer. The default is 1 bit.

Parity

Set for odd parity, even parity, mark, sense, or no parity. The setting must match the corresponding parity setting in the host computer. The default is None.

Data Terminal Ready

This configuration is part of hardware flow control and determines when the Data Terminal Ready (DTR) signal is generated. This signal indicates whether or not the printer is ready to receive data.

- **True.** Continuously asserts the DTR signal (the default).
- **On-Line and BNF (buffer not full).** Asserts the DTR signal when the printer is online and the internal serial buffer is not full.
- **Off-Line or BF (buffer full).** Asserts the DTR signal when the printer is offline or the internal serial buffer is full.
- **False.** Never asserts the DTR signal.

Request to Send

This configuration is part of hardware flow control and determines when the Request to Send (RTS) signal is generated. This signal indicates whether or not the printer is ready to receive data.

- **True.** Continuously asserts the RTS signal (the default).
- **On-Line and BNF.** Asserts the RTS signal when the printer is online and the internal serial buffer is not full.
- **Off-Line or BF.** Asserts the RTS signal when the printer is offline or the internal serial buffer is full.
- **False.** Never asserts the RTS signal.

Buffer Size in K

Configures the amount of memory allocated for the serial port buffer. The default is 8 Kbytes, but you may specify between 1 and 16 Kbytes, in 1-Kbyte increments.

NOTE: If you select a baud rate that is 19200 or greater, you may need to increase the Buffer Size in K parameter from the default to 16 Kbytes to improve performance.

Parallel Submenu

Centronics Interface

IMPORTANT   **The Centronics parameters in the printer must be set the same as the Centronics interface in the host computer. Otherwise, the printer might not work online, and data characters from the computer might not print or might print as "garbled" text.**

* = Factory Default
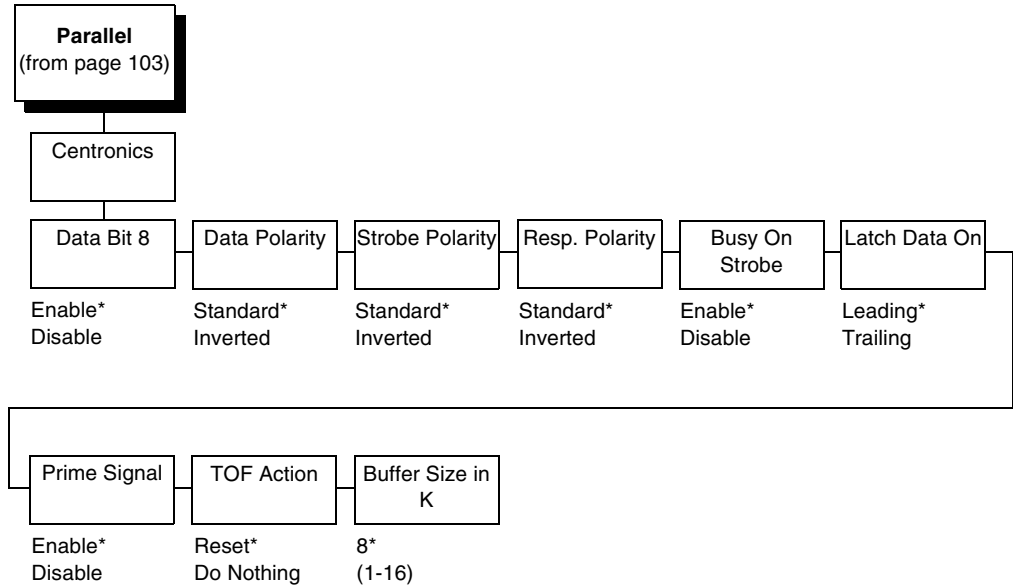
The Centronics submenu provides the options and settings available to configure the interface as required for your application. These options and available settings are outlined in the following paragraphs.

Data Bit 8

- **Enable.** Allows access to the extended ASCII character set.

- **Disable.** The printer interprets bit 8 of each incoming data character as a zero, regardless of its actual setting.

Data Polarity

The Data Polarity parameter must be set to match the data polarity of your host computer.

- **Standard.** Does not expect the host computer to invert the data.

- **Inverted.** Expects the data received on the data lines from the host computer to be inverted. Ones become zeros, and vice-versa.

Strobe Polarity

The Strobe Polarity must be set to match the data strobe polarity of your host computer. When the host computer sends a data strobe signal to the printer, this enables the printer to read the data bus.

- **Standard.** Does not expect the data strobe signal to be inverted.
- **Inverted.** Expects the host computer to invert the data strobe signal.

Response Polarity

The Response Polarity parameter must be set to match the response polarity of your host computer. This option sets the polarity of the Acknowledge, Online, Fault, Paper Empty, and Busy signals.

- **Standard.** Does not invert the response signals.
- **Inverted.** Inverts the response signals sent to the host computer.

Busy on Strobe

- **Enable.** Asserts a busy signal after each character is received.
- **Disable.** Asserts a busy signal only when the print buffers are full.

Latch Data On

The Latch Data On parameter specifies whether the data is read on the leading or trailing edge of the data strobe signal.

Prime Signal

- **Enable.** The parallel port performs a warm start (reboot) if the host asserts the prime signal.
- **Disable.** The parallel port does not perform a warm start (reboot) if the host asserts the prime signal.

TOF Action

TOF (Top-Of-Form) Action determines whether or not a form feed is performed before a warm start when the prime signal is asserted from the host. This setting is used only if the Prime Signal parameter is enabled.

- **Reset.** Form feed on reset.
- **Do Nothing.** No form feed on reset.

Buffer Size in K

Configures the amount of memory allocated for the Centronics parallel port buffer. The default is 8 Kbytes, but you can specify between 1 and 16 Kbytes, in 1-Kbyte increments.

Dataproducts Submenu

IMPORTANT **The Dataproducts parameters in the printer must be set the same as the Dataproducts interface in the host computer. Otherwise, the printer might not work online, and data characters from the computer might not print or might print as "garbled" text.**

* = Factory Default

```
┌─────────────┐
│  Parallel   │
│(from page 103)│
└─────────────┘
       │
┌─────────────┐
│ Dataproducts│
└─────────────┘
```

Data Bit 8	PI Ignored	Data Polarity	Data Request Pol.	Strobe Polarity	Buffer Size in K
Enable* Disable	Enable* Disable	Standard* Inverted	Standard* Inverted	Standard* Inverted	8* (1-16)
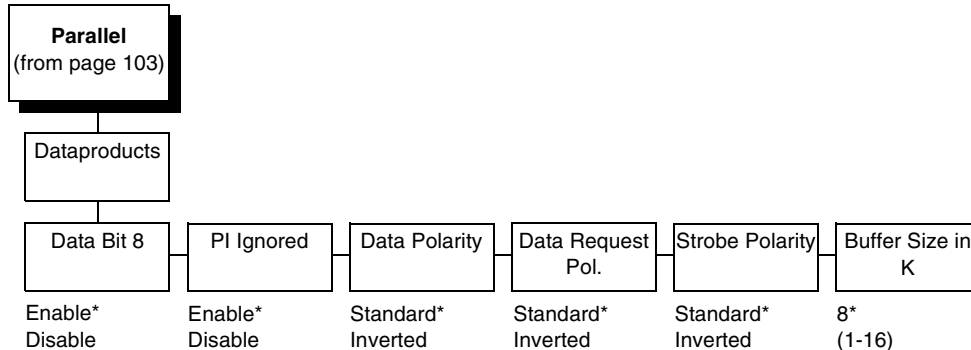
The Dataproducts submenu provides the options and settings available to configure the interface as required for your application. These options and available settings are outlined in the following paragraphs.

Data Bit 8

- **Enable.** Allows access to the extended ASCII character set.

- **Disable.** The printer interprets bit 8 of each incoming data character as a zero, regardless of its actual setting.

PI Ignored

The PI (Paper Instruction) signal is used to control vertical paper motion.

- **Enable.** Ignores the PI signal and treats the data as characters or control codes.

- **Disable.** Causes the printer to interpret the eight data lines as VFU commands when the PI signal is true.

Data Polarity

The Data Polarity parameter must be set to match the data polarity of your host computer.

- **Standard.** Does not expect the host computer to invert the data.

- **Inverted.** Expects the data received on the data lines from the host computer to be inverted. Ones become zeros, and vice-versa.

Data Request Polarity

The Data Request Polarity parameter must be set to match the data request polarity of your host computer.

- **Standard.** Does not invert the request signal.

- **Inverted.** Inverts the request signal sent to the host computer.

Strobe Polarity

The Strobe Polarity must be set to match the data strobe polarity of your host computer. When the host computer sends a data strobe signal to the printer, this enables the printer to read the data bus.

- **Standard.** Does not expect the data strobe signal to be inverted.

- **Inverted.** Expects the host computer to invert the data strobe signal.

Buffer Size in K

This option configures the amount of memory allocated for the Dataproducts parallel port buffer. The default is 8 Kbytes, but you can specify between 1 and 16 Kbytes, in 1-Kbyte increments.

Bidirectional Submenu

The IEEE 1284 (Bidirectional) interface is faster and more versatile than
Centronics and supports bidirectional communication. Chapter 5 discusses
the available modes (Compatibility, Nibble, and Byte) in more detail.

* = Factory Default

```
        ┌─────────────────┐
        │    Parallel     │
        │ (from page 103) │
        └─────────────────┘
                 │
        ┌─────────────────┐
        │  Bidirectional  │
        └─────────────────┘
                 │
        ┌─────────────────┐
        │ Buffer Size in  │
        │       K         │
        └─────────────────┘
             8*
            (1-16)
```
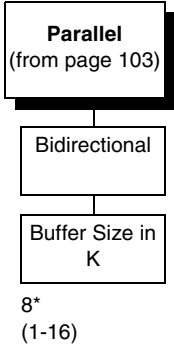
Buffer Size in K

This option configures the amount of memory allocated for the 1284 parallel
port buffer. The default is 8 Kbytes, but you can specify between 1 and 16
Kbytes, in 1-Kbyte increments.

PRINTER CONTROL

The printer control menu allows you to choose the printer's behavior. Options on this menu, as shown below, are described in the following pages.
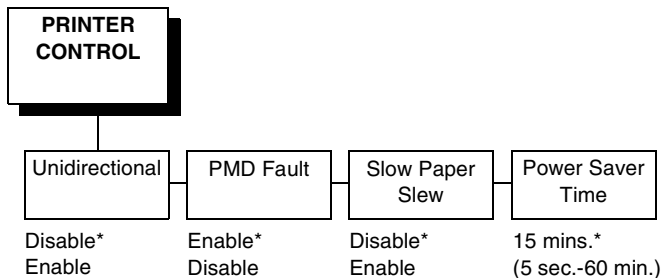
```
          ┌─────────────┐
          │  PRINTER    │
          │  CONTROL    │
          └─────────────┘
                │
    ┌───────────┼───────────┬───────────┐
┌───────────┐┌───────────┐┌───────────┐┌───────────┐
│Unidirectional││ PMD Fault ││Slow Paper ││Power Saver│
│           ││           ││   Slew    ││   Time    │
└───────────┘└───────────┘└───────────┘└───────────┘

Disable*     Enable*      Disable*     15 mins.*
Enable       Disable      Enable       (5 sec.-60 min.)
```

To view options, press: ⇓ Down

⇑ Up

⇒ Next

⇐ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ONLINE.

* = Default Setting

Unidirectional

The Unidirectional feature affects both print quality and printing speed. By setting this feature, you can configure the printer to print in both directions of the shuttle sweep (bidirectional), or to print in one direction only (unidirectional).

You might want to enable this feature when printing bar codes, high quality text and graphics, or other printing that requires precise vertical alignment.

Although enabling this feature reduces print speed, it enhances the vertical alignment of dots and produces cleaner, sharper bar codes and text.

- **Disable.** The default. The printer will print all data in both directions of the shuttle sweep (bidirectional printing). This choice produces higher printing speed.

- **Enable.** The printer will print all data in only one direction of the shuttle sweep (unidirectional printing). This choice produces higher print quality.

PMD (Paper Motion Detection) Fault

- **Enable.** If a paper jam occurs, an audible alarm beeps, "CLEAR PAPER JAM" appears on the message display, and the printer stops printing.

- **Disable.** You should disable PMD only if special paper requires it.

CAUTION   **Once PMD is disabled, paper motion is not monitored. If a paper jam occurs, the printer ignores the condition and continues to print, possibly causing severe damage to the printer.**

Slow Paper Slew

This parameter affects the speed at which paper advances into the stacking area of the printer. The speed will be slowed by enabling this feature.

- **Disable.** The default. The printer will slew and stack paper at maximum speed.

- **Enable.** Causes the paper to stack at a slower rate. This ensures that certain forms will stack more neatly.

Power Saver Time

This parameter allows the printer to lower electricity consumption while it stays idle. The time interval you specify for this parameter sets the number of minutes of idle time before the printer goes into Power Saver mode. The default setting is 15 minutes, but you can specify a range between 5 seconds and 60 minutes.

Pressing any key will remove the power saver message from the control panel. Sending a print job to the printer will turn off power saver mode.

DIAGNOSTICS

The diagnostics menu allows you to choose the diagnostics tests to be run and provides you with important system information. Options on this menu, as shown below, are described in the following pages.

```
┌─────────────┐
│ DIAGNOSTICS │
└─────────────┘
```

Printer Tests	Test Width	Paper Out Dots	System Memory	Print Statistics
Shift Recycle*	Full Width*	40 dots*	X Megabytes	On: X.X hrs.
All E's	80 columns	(4-76)		Print: X.X hrs.
E's + TOF				Print Strokes
All H's				Print Lines
All Underlines				11 inch Pages
All Black				
Shuttle Slow				
Shuttle Fast				
Shuttle Only				
Phase Printer				
217* (500 lpm)				
123* (1000 lpm)				
62* (1500 lpm)				
1 to 2000				
Paperout Adj.				
Burnin Test				
Print Error Log				
Clear Error Log				

To view options, press: ⇓ Down

⇑ Up

⇒ Next

⇐ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ONLINE.

* = Default Setting

Printer Tests

The printer tests are used to check the print quality and operation of your printer.

NOTE: Your authorized service representative will typically run these tests. They are described in more detail in the *Maintenance Manual.*

Brief descriptions for the printer tests follow:

- **Shift Recycle.** A sliding alphanumeric pattern that identifies missing or malformed characters, improper vertical alignment, or vertical compression.

- **All E's.** A pattern of all uppercase E's that identifies missing characters, misplaced dots, smeared characters, improper phasing problems, or light/dark character variations.

- **E's plus TOF.** A pattern of all E's followed by a form feed to the next page top-of-form, that identifies paper motion or feeding problems.

- **All H's.** A pattern of all uppercase H's used to detect missing characters, misplaced dots, smeared characters, or improper phasing.

- **All Underlines.** An underline pattern useful for identifying hammer bank misalignment.

- **All Black.** A condition where all dot positions are printed, creating a solid black band.

- **Shuttle Slow.** Verifies proper operation by exercising shuttle and ribbon motion at low speed.

- **Shuttle Fast.** Verifies proper operation by exercising shuttle and ribbon motion at fast speed.

- **Shuttle Only.** Exercises only the shuttle at fast speed.

- **Phase Printer.** Checks for wavy print. The initial phase value is set in the factory. Run the test and check the quality. The phase value prints on the left margin. If the print looks too wavy, change the Phase Value parameter while the test is running. While the phase printer test runs, press the DOWN key. To change the value, press the PREV or NEXT key until the desired value displays and then press ENTER.

- **Paperout Adjust.** This test verifies the current Paper Out Dots setting, which determines where the last line of text will print when there is a paper out condition. Setting this parameter correctly prevents printing on the platen from occurring. The *Maintenance Manual* describes in detail how to run this test. Only an authorized service representative should run this test.

- **Burnin Test.** Reserved for factory use.

- **Print Error Log.** Prints the current log of errors. Most non-routine faults (ribbon stall, voltage faults) are stored in the error log.

- **Clear Error Log.** Clears entries in the error log.

Test Width

This parameter permits you to run the self-tests at full width or 80 columns.

Paper Out Dots

This parameter is used to adjust the paper out distance from the perforation; you can specify where the last line on the page will print when there is a paper out condition. Setting this parameter correctly prevents printing on the platen.

Only authorized service representatives should set this parameter.

System Memory

This parameter displays the amount of RAM installed.

Print Statistics

You can view various printer statistics, such as hours of usage, and refer to these figures for preventive maintenance purposes. Printer statistics accumulate continuously; they do not reset when you turn off the printer. All of the printer statistics are set to zero at the factory after burn-in testing.

- **On.** The cumulative time in hours the printer has been powered on. The range is 0 to 30,000 hours.

- **Print.** The cumulative time in hours the printer has actually been printing. The range is 0 to 30,000 hours.

- **Print Strokes.** The cumulative number of back-and-forth shuttle strokes the printer has printed during normal printer operation. The range is 0 to 2,147,483,647 shuttle strokes.

- **Print Lines.** The cumulative number of lines the printer has printed. The range is 0 to 2,147,483,647 print lines.

- **11 inch Pages.** The cumulative number of pages the printer has printed. The range in print pages is 0 to 2,147,483,647 total pages of paper movement.

RIBBONMINDER

RibbonMinder™ monitors ink consumption to ensure quality printing. The "RibbonMinder" chapter explains how to use this feature and its options in more detail.
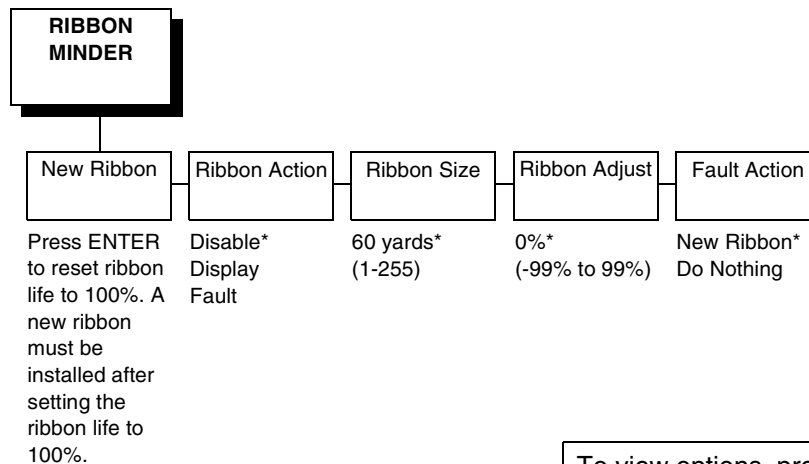
```
┌─────────────┐
│   RIBBON    │
│   MINDER    │
└─────────────┘
       │
┌────────────┬─────────────┬────────────┬──────────────┬─────────────┐
│ New Ribbon │Ribbon Action│Ribbon Size │Ribbon Adjust │ Fault Action│
└────────────┴─────────────┴────────────┴──────────────┴─────────────┘
```

New Ribbon	Ribbon Action	Ribbon Size	Ribbon Adjust	Fault Action
Press ENTER to reset ribbon life to 100%. A new ribbon must be installed after setting the ribbon life to 100%.	Disable* Display Fault	60 yards* (1-255)	0%* (-99% to 99%)	New Ribbon* Do Nothing

To view options, press: ⇓ Down

⇑ Up

⇒ Next

⇐ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ONLINE.

* = Default Setting

New Ribbon

Whenever you install a new ribbon, you must reset the ribbon life to 100%. Use the New Ribbon option to reset the ribbon display.

Ribbon Action

This option allows you to perform three functions:

• activate the RibbonMinder ink consumption display

• disable the ink consumption display

• flash a fault message when the display reaches 0%

Displaying the ribbon ink consumption allows you to monitor the percentage of ink left in the ribbon. Disabling the ink consumption monitor removes the visual display, but allows RibbonMinder to continue monitoring how much ink is left in the ribbon. The Fault option activates a flash message when the display reaches 0%. The default is disable.

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Ribbon Size

The standard ribbon size is 100 yards in the cabinet model and 60 yards in the pedestal model; these are the factory default settings. You can use the Ribbon Size option to specify the ribbon length in increments of one yard with a maximum of 255 yards.

Ribbon Adjust

Enables you to print more or less pages before the display reaches 0%. If the ribbon normally prints 1000 pages before reaching 0%, configuring the Ribbon Adjust to 10% will print 10% more pages before reaching 0%. A -10% will cause the display to reach 0% after 10% fewer pages. The setting can range from -99% to 99%. 0% is the default.

Fault Action

When set to New Ribbon (the default), opening the platen while in RIBBON INK OUT / CHANGE RIBBON fault will reset the ribbon life to 100%, just as if the New Ribbon menu option was executed.

When set to Do Nothing, the ribbon life may only be reset through the New Ribbon menu option.

5 *Interfaces*

Overview

This chapter describes the interfaces provided with the printer. The printer interface is the point where the data line from the host computer plugs into the printer. The interface processes all communication signals and data to and from the host computer. It consists of a printed circuit board assembly (PCBA) and a connector for the data cable from the host computer. Communication signals and data may be sent over parallel or serial lines.

IMPORTANT **The printer is equipped with three parallel interfaces and two serial interfaces. Only one interface can be used at a time, and it must be selected via the configuration menu. (Refer to "HOST INTERFACE" on page 103.) A data cable cannot be plugged into the Dataproducts parallel connector and the Centronics parallel connector at the same time.**

This chapter describes the interfaces provided with the printer.

- Dataproducts parallel
- Centronics parallel
- IEEE 1284 parallel bidirectional
- RS-232 serial
- RS-422 serial

In addition to descriptions for each interface, this chapter also provides instructions for configuration of terminating resistors for the parallel interfaces.

Dataproducts Parallel Interface

The Dataproducts parallel interface allows the printer to operate with a 50-pin Amplimite (AMP) HDH-20 data cable connector. The length of the data cable from the host computer to the printer must not exceed 40 feet (12 meters).

Table 11. Dataproducts Parallel Interface Connector Pin Assignments (with a 50-pin AMP HDH-20 Data Cable Connector)

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
DATA LINE 1	19	READY	22	CABLE VERIFY	45, 46
Return	3	Return	6		
DATA LINE 2	20	ONLINE	21	GROUND	39
Return	4	Return	5		
DATA LINE 3	1	DEMAND/DATA REQ.	23	TEST	12
Return	2	Return	7		
DATA LINE 4	41	PARITY ERROR	27		
Return	40	Return	11		
DATA LINE 5	34				
Return	18				
DATA LINE 6	43				
Return	42				
DATA LINE 7	36				
Return	35				
DATA LINE 8	28				
Return	44				
DATA STROBE	38				
Return	37				
PAPER INSTRUCTION	30				
Return	14				
BUFFER CLEAR	31				
Return	15				
NOTE: Pins not listed are not connected.					

Dataproducts Parallel Interface Signals

Dataproducts-compatible interface signals between the host computer and the printer are defined as follows:

Data Lines 1 through 8. Provide eight standard or inverted levels from the host that specify character data, plot data, or a control code. Data Line 8 allows access to the extended ASCII character set. You can enable or disable this line via the Data Bit 8 parameter on the Dataproducts submenu (page 109).

Data Strobe. Carries a high true pulse from the host when data is ready. The data strobe remains high until the Data Request line goes false. The active

edge of the strobe signal can be configured as leading, middle (default), or trailing.

Paper Instruction (PI). Carries a DVFU signal from the host with the same timing and polarity as the data lines.

Ready. Carries a high true signal from the printer when AC power and DC voltages are present, paper is loaded properly, and the printer is not in a check condition.

Online. Carries a high true signal from the printer when the Ready Line is true and the ON LINE key on the control panel has been pressed. When the printer is in online mode, it may accept data from the host.

Demand/Data Request. Carries a high true signal from the printer when the printer is ready to accept character data from the host. This signal changes to false shortly after the leading edge of the data strobe signal.

Cable Verify. Two pins on the interface connector are jumpered together to allow the user to verify proper installation of the interface connector.

Prime Signal. A high true level from the host to indicate the printer should perform a reboot.

Test. This signal is connected to +5 volts through a 470 ohm resistor.

Parity Error. Always carries a low false signal from the printer indicating there is no parity error.

Dataproducts Parallel Interface Configuration

Your printer is configured at the factory to match the interface you specified. By using the control panel, you can verify and change several interface parameters in order to meet specific application requirements.

Refer to "Dataproducts Submenu" on page 109 for Dataproducts parameter descriptions and information on selecting values for the following parameters:

- Data Bit 8 (enable or disable)
- PI Ignored (enable or disable)
- Data Polarity (standard or inverted)
- Data Request Polarity (standard or inverted)
- Strobe Polarity (standard or inverted)
- Buffer Size in K (1-16)

Some application programs require a unique configuration. If the printer is not working properly in the configuration you have selected, contact an authorized service representative.

Centronics Parallel Interface

The Centronics interface enables the printer to operate with controllers designed for buffered Centronics printers. The length of the data cable from the host computer to the printer must not exceed 15 feet (5 meters).

Table 12. Centronics Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
DATA LINE 1 Return	2 20	ACKNOWLEDGE Return	10 28	CHASSIS GROUND	17
DATA LINE 2 Return	3 21	ONLINE Return	13 28	GROUND	30
DATA LINE 3 Return	4 22	FAULT Return	32 29	Spares	14
DATA LINE 4 Return	5 23	PAPER EMPTY Return	12 28	No Connection	34,35, 36
DATA LINE 5 Return	6 24	BUSY Return	11 29	+5 Volts	18
DATA LINE 6 Return	7 25				
DATA LINE 7 Return	8 26				
DATA LINE 8 Return	9 27				
DATA STROBE Return	1 19				
PAPER INSTRUCTION Return	15 29				
PRIME Return	31 30				

Centronics Interface Signals

The Centronics interface signals between the host computer and the printer are defined as follows:

Data Lines 1 through 8. Provide eight standard or inverted levels from the host that specify character data, plot data, or a control code. Data Line 8 allows access to the extended ASCII character set. You may enable or disable this line via the Data Bit 8 parameter on the Centronics submenu (page 107).

Data Strobe. Carries a low true, 100 ns minimum pulse from the host that clocks data into the printer.

Acknowledge. A low true pulse from the printer indicating the character or function code has been received and the printer is ready for the next data transfer.

Online. A high true level from the printer to indicate the printer is ready for data transfer and the ON LINE key on the control panel has been activated. When the printer is in online mode, it may accept data from the host.

Paper Empty (PE). A high true level from the printer to indicate the printer is in a fault condition.

Busy. A high true level from the printer to indicate the printer cannot receive data.

Prime. A high true level from the host to indicate the printer should perform a reboot.

Paper Instruction (PI). Carries a CVFU signal from the host with the same timing and polarity as the data lines.

Centronics Parallel Interface Configuration

Your printer is configured at the factory to match the interface you specified. By using the control panel, you can verify and change several interface parameters in order to meet specific application requirements.

Refer to "Parallel Submenu" on page 107 for Centronics parameter descriptions and information on selecting values for the following parameters:

- Data Bit 8 (enable or disable)
- Data Polarity (standard or inverted)
- Strobe Polarity (standard or inverted)
- Response Polarity (standard or inverted)
- Busy on Strobe (enable or disable)
- Latch Data On Leading or Trailing Edge of Strobe
- Prime Signal (enable or disable)
- TOF Action (reset or do nothing)
- Buffer Size in K (1-16)

Some application programs require a unique configuration. If the printer is not working properly in the configuration you have selected, contact an authorized service representative.

Terminating Resistor Configurations

The factory equips the printer with several resistors that are used for parallel interface configurations and are suitable for most applications. These 470 ohm pull-up and 1K ohm pull-down terminating resistors are located at RP1 and RP2, shown in Figure 45.

If the values of these terminating resistors are not compatible with the particular interface driver requirements of your host computer, you may need to install resistors with different pull-up and pull-down values.

RP1 Default: 470 ohm
Alt 1: 220 ohm
Alt 2: 1K ohm

RP2 Default: 1K ohm
Alt 1: 330 ohm
Alt 2: none
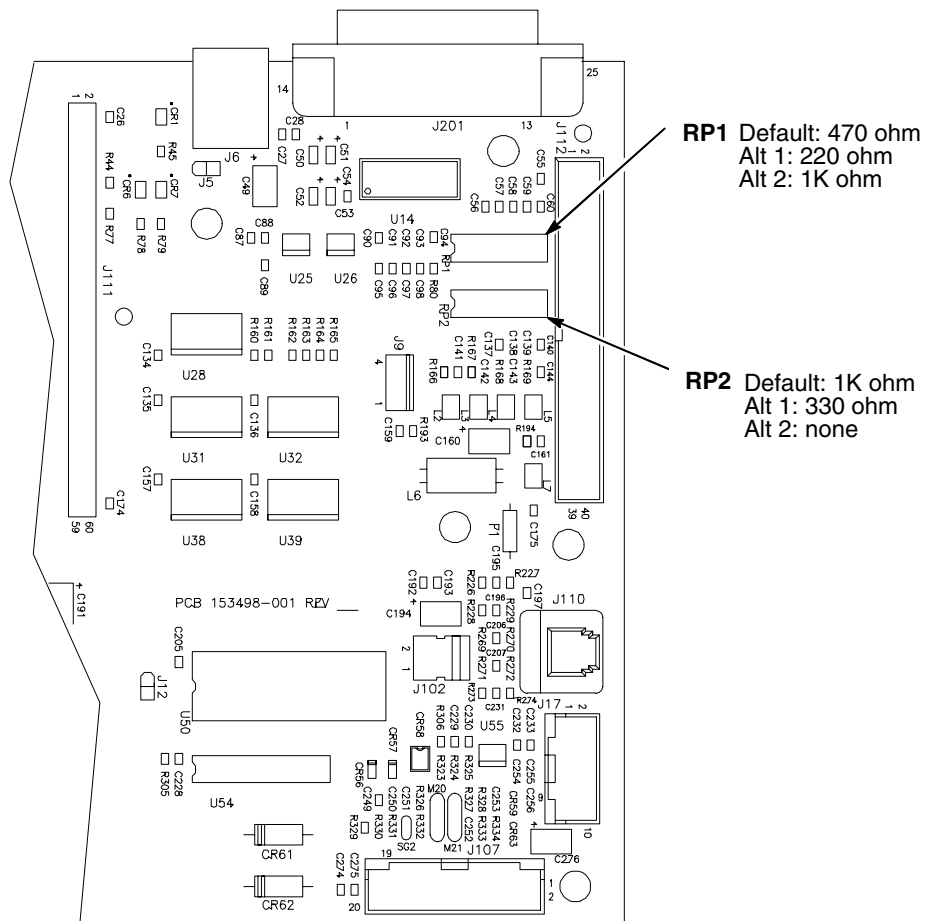
Figure 45. Resistor Locations

The shipping kit for this printer includes 220 ohm pull-up and 330 ohm pull-down alternate terminating resistors. If you install the 220 ohm pull-up resistor, you must also install the 330 ohm pull-down resistor. Table 13 lists the three terminating resistor configurations you can install:

Table 13. Terminating Resistor Configurations

Configuration	Pull-Up (RP1)	Pull-Down (RP2)
Factory Default	470 ohm	1K ohm
Alternate 1	220 ohm	330 ohm
Alternate 2	1K ohm	none

Removal and Installation

IMPORTANT **This is an involved maintenance procedure; only a trained technician should perform this procedure.**

The procedure for removing and installing terminating resistors is provided in the *Maintenance Manual.*

IEEE 1284 Parallel Interface

The IEEE 1284 is a parallel interface with bidirectional capabilities. Features include the following:

- Timing of the signals has been reduced, therefore speeding data transmission.

- Bidirectional communication. Both the host and the printer can send data.

- Versatility. If a device can not send data along particular lines, the 1284 can send data via other operating modes, such as Nibble Mode which is discussed later.

- Less user interaction. The host can ask the printer about printing status and supported features, such as fonts and internal errors. For example, instead of having to physically check if the printer has run out of paper, you can create a program to query this from the host. The printer will respond and a message will display on the host.

Operating Modes

The 1284 supports three operating modes, which are determined by negotiation between the printer and the host.

Compatibility Mode

This mode provides compatibility with Centronics-like host I/O. Data is transferred from the host to the printer in 8-bit bytes over the data lines.

Compatibility Mode can be combined with Nibble and Byte Modes to provide bidirectional communication.

Nibble Mode

Eight bits equals one byte. When a byte of data is sent to the printer, the eight bits are sent over eight data lines.

Some devices cannot send data over their eight data lines. To bypass this, the 1284 permits data to be sent as half a byte over four status lines. (Half a byte equals one nibble.) Two sequential four-bit nibbles are sent over the lines.

Data is transferred from printer to host in four-bit nibbles over the status lines, and the host controls the transmission.

Byte Mode

The printer and host send data to each other along eight data lines (one bit per line).

If bidirectional communication is supported by the printer and the host, the host will take control of the data transfer.

The Negotiation Phase

The negotiation phase determines which operating mode will be used. At this time, the host and the printer will sense what devices are attached, the supported signals available, and which mode to use. The selected mode, in turn, defines the pins on the 1284 connector.

There are 36 pins on the parallel interface. Each one sends a different signal. Pin 1, for example, can send a Strobe signal or a HostClk signal, depending on the mode selected. Table 14 shows the different definitions.

Signals

1284 interface signals between the host and the printer are defined below.

Host Clock / nWrite. Driven by host. Data transferred from host to printer. When printer sends data, two types are available. If Nibble Mode, signal is set high. If Byte Mode, signal is set low.

Data 1 through Data 8. These pins are host-driven in Compatibility Mode and bidirectional in Byte Mode. They are not used in Nibble Mode. Data 1 is the least significant bit; Data 8 is the most significant bit.

Printer Clock / Peripheral Clock / Interrupt. Driven by the printer. A signal from the printer indicating the character or function code has been received and the printer is ready for the next data transfer.

Printer Busy / Peripheral Acknowledge / nWait. Driven by the printer. Indicates the printer cannot receive data. (Data bits 4 and 8 in Nibble Mode.)

Acknowledge Data Request / nAcknowledge Reverse. Driven by the printer. Indicates the printer is in a fault condition. (Data bits 3 and 7 in Nibble Mode.)

Xflag. Driven by the printer. A high true level indicating the printer is ready for data transfer and the printer is on-line. (Data bits 2 and 6 in Nibble Mode.)

Host Busy / Host Acknowledge / NDStrobe. Driven by the host. Activates auto-line feed mode.

Peripheral Logic High. Driven by the printer. When set high, the printer indicates all of its signals are in a valid state. When set low, the printer indicates its power is off or its signals are in an invalid state.

nReverse Request. Driven by the host. Resets the interface and forces a return to Compatibility Mode idle phase.

nData Available / nPeripheral Request. Driven by the printer. Indicates the printer has encountered an error. (Data bits 1 and 5 in Nibble Mode.)

1284 Active / nAStrobe. Driven by the host. A peripheral device is selected.

Host Logic High. Driven by the host. When set to high, the host indicates all of its signals are in a valid state. When set to low, the host indicates its power is off or its signals are in an invalid state.

nInit. Resets init interface from the host.

NOTE: The length of the data cable from the host computer to the printer should not exceed 10 meters (32 feet).

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Table 14. 1284 Signals

Pin	Source of Data	Type of Mode		
		Compatible	Nibble	Byte
1	Host	nStrobe	HostClk	Host/Clk
2	Host/Printer	Data 1 (LSB)		
3	Host/Printer	Data 2		
4	Host/Printer	Data 3		
5	Host/Printer	Data 4		
6	Host/Printer	Data 5		
7	Host/Printer	Data 6		
8	Host/Printer	Data 7		
9	Host/Printer	Data 8 (MSB)		
10	Printer	nAck	PtrClk	PtrClk
11	Printer	Busy	PtrBusy	PtrBusy
12	Printer	PError	AckDataReq	AckDataReq
13	Printer	Select	Xflag	Xflag
14	Host	nAutoFd	Host Busy	HostAck
15		Not Defined		
16		Logic Grid		
17		Chassis Grid		
18	Printer	Peripheral Logic High		
19		Signal Ground (nStrobe)		
20		Signal Ground (Data 1)		
21		Signal Ground (Data 2)		
22		Signal Ground (Data 3)		
23		Signal Ground (Data 4)		
24		Signal Ground (Data 5)		
25		Signal Ground (Data 6)		
26		Signal Ground (Data 7)		
27		Signal Ground (Data 8)		

Table 14. 1284 Signals (continued)

Pin	Source of Data	Type of Mode		
		Compatible	Nibble	Byte
28		Signal Ground (PError, Select, nAck)		
29		Signal Ground (Busy, nFault)		
30		Signal Ground (nAutoFd, nSelectIn, nInit)		
31	Host	nInit		
32	Printer	NFault	nDataAvail	aDataAvail
33		Not Defined		
34		Not Defined		
35		Not Defined		
36	Host	nSelectIn	1284 Active	1284 Active

RS-232 and RS-422 Serial Interfaces

NOTE: The RS-232 and RS-422 serial interface circuit characteristics are compatible with the Electronic Industry Association Specifications EIA®-232-E and EIA-422-B.

The RS-232 and RS-422 serial interfaces enable the printer to operate with bit serial devices that are compatible with an RS-232 controller. The input serial data transfer rate (in baud) is selectable from the printer control panel. Baud rates of 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115K are available. The default is 9600.

NOTE: If you select a baud rate that is 19200 or greater, you may need to increase the Buffer Size in K parameter from the default (8 Kbyte), to improve performance.

The input format consists of a single start bit, 7 or 8 data bits, and one or two stop bits. The number of data bits is determined by printer configuration. The data bits are interpreted with the least significant bit first. Parity checking is determined by printer configuration options selected from the control panel.

The printer interface uses a first-in/first-out buffer. The asynchronous interface accepts data as it is provided by the host. The length of the data cable from the host computer to the printer must not exceed 50 feet (15 meters) for RS-232 or 4000 feet (1220 meters) for RS-422. A copper conductor, twisted-pair telephone cable with a shunt capacitance of 16 pF/foot (52.5 pF/meter) terminated in a 100 ohm resistive load must be used for the RS-422.

Table 15. RS-232 Serial Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
Receive Data (RD)	3	Transmit Data (TD)	2	Chassis Ground	1
Clear To Send (CTS)	5	Request To Send (RTS)	4	Signal Ground	7
Data Set Ready (DSR)	6	Data Terminal Ready (DTR)	20		
Data Carrier Detect (DCD)	8				

Table 16. RS-422 Serial Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
- Receive Data (-RD)	15	- Transmit Data (-TD)	19	Chassis Ground	1
+ Receive Data (+RD)	17	+ Transmit Data (+TD)	25	Signal Ground	7

RS-232 and RS-422 Serial Interface Signals

The RS-232 connector mounted on the printer is a 25-pin DB-25S type. The mating connector is a DB-25P. RS-232 and RS-422 compatible serial interface signals are defined as follows:

RS-232

Received Data (RD). Serial data stream to the printer.

Transmitted Data (TD). Serial data stream from the printer for transmitting status and control information to the host. Subject to protocol selection.

Request To Send (RTS). Control signal from the printer. Subject to configuration.

Clear To Send (CTS). Status signal to the printer indicating the host is ready to receive data/status signals from the printer.

Data Set Ready (DSR). Status signal to the printer indicating the host is in a ready condition.

Data Carrier Detect (DCD). Status signal to the printer. The ON condition is required for the printer to receive data.

Data Terminal Ready (DTR). Control signal from the printer. Subject to configuration.

RS-422

+RD, -RD. Serial data stream differentially received by printer.

+TD, -TD. Differentially driven serial data stream for transmitting status and control information to the host. Subject to protocol selection.

NOTE: ±RD and ±TD form signal and return paths of a differential line signal.

RS-232 and RS-422 Serial Interface Protocol

XON/XOFF. The printer transmits an XON character (hex 11) when entering the online mode or when the buffer is almost empty. The printer transmits an XOFF character (hex 13) when entering the offline mode or when the buffer is almost full.

RS-232 and RS-422 Serial Interface Error Handling

NOTE: All serial errors are treated as faults that require operator intervention.

Parity Error Handling. Parity error checking is a configuration option selected from the control panel.

With odd or even parity checking selected, a character with a parity error is replaced with a question mark (?) character.

When parity checking is not selected ("NONE" on the control panel), parity errors are ignored and the characters are printed as received.

Framing Error Handling. Framing error checking is always in effect for the serial interface.

When a framing error occurs, an exclamation point (!) is printed. If 20 successive errors are received, a line feed is added to force printing to occur.

Overrun Error Handling. Overrun error checking is always in effect for the serial interface.

When a data overrun error occurs, an asterisk (*) is printed. If 20 successive errors are received, a line feed is added to force printing to occur.

RS-232 and RS-422 Serial Interface Configuration

Your printer is configured at the factory to match the interface you specified. By using the control panel, you can verify and change several interface parameters in order to meet specific application requirements.

Refer to "Serial Submenu" on page 104 for RS-232 and RS-422 parameter descriptions and information on selecting values for the following parameters:

RS-232 and RS-422

*   Baud Rate (data rate selected from the control panel)
*   Data Bits (7 or 8 Bits)
*   Stop Bits (1 or 2 Bits)
*   Parity (None, Odd, Even, Mark, or Sense)

RS-232 only

*   Data Terminal Ready logic
*   Request to Send logic

Some application programs require a unique configuration. If the printer is not working properly with the configuration you selected, contact an authorized service representative.

NOTE: When using Compaq's RapidPrint™ 200 LAN product, DTR must be disabled from the RapidPrint.

VMS Operating System

When using the parallel interface with the VMS™ operating system, configure the printer with the SET PRINTER command, as shown below.

Interface Configuration

Printer LCA0:, device type unknown, is on-line, allocated record-oriented device, carriage control, device is spooled through an intermediate device, error logging is enabled.

Error count 0

Owner process "SYMBIONT_0001"

Owner process ID00000087

Reference Count2

Page width 132

Carriage returnFormfeed

No passall   No Wrap

No FallbackTab

Intermediate device:DUA1

Associated queue:LCA0

Operations completed1

Owner UIC [0, 0]

Dev Prot   S:RWLP, 0:RWLP, W:RWLP

Default buffer size132

Page length66

Lowercase

Printall

No Truncate

When using the serial interface with the VMS operating system, configure the terminal characteristics with the SET TERM command, as shown below:

Terminal: _TXA3: Device_Type: Unknown Owner: SYMBIONT_0001
Username: SYSTEM

Input: 9600*   LFfill: 0   Width: 132**   Parity: None
Output: 9600*   CRfill: 0   Page: 66

Terminal Characteristics:

Interactive	Echo	Type_ahead	No_Escape
No_Hostsync	TTsync	Lowercase	Tab
No_Wrap	Scope	No_Remote	No_Eightbit
No_Broadcast	No_Readsync	Form	Fulldup
No_Modem	No_Local_echo	No_Autobaud	No_Hangup
No_Brdcstambx	No_DMA	No_Altypeahd	Set_speed
Line_Editing	Overstrike_editing	No_Fallback	No_Dialup
No_Secure_server	No_Disconnect	No_Pasthru	No_Syspassword
No_SIXEL_Graphics	No_Soft_Characters	No_Printer_Port	Numeric_Keypad
No_ANSI_CRT	No_Regis	No_Block_mode	No_Advanced_video
No_Edit_mode	No_DEC_CRT	No_DEC_CRT	

Device spooled to _DUAL:

* Match baud rate to printer settings.

** When using the Line Printer Plus emulation, the input width is 136.

6 *Routine Service and Diagnostics*

Cleaning Requirements

Periodic cleaning is the only routine maintenance your printer requires to ensure efficient operation and clear print quality.

If print quality deteriorates even after cleaning, contact your authorized customer service engineer.

Clean the printer every six months or after every 1000 hours of operation, whichever occurs first.

If the printer is located in a dusty area or is used for heavy duty printing, clean it more often.

WARNING   **Disconnect the power source before cleaning the printer.**

WARNUNG   **Vor dem Säubern des Druckers ist die Netzverbindung zu unterbrechen.**

ATTENTION   **Débranchez l'alimentation avant de nettoyer l'imprimante.**

Exterior Cleaning

Clean the outside of the cabinet with a soft, lint-free cloth and mild detergent soap. Dishwashing liquid works well. Do not use abrasive powders or chemical solvents. Clean the windows with plain water or mild window cleaner. Always apply the cleaning solution to the cloth; never pour cleaning solution directly onto the printer.

Interior Cleaning

Over time, particles of paper and ink accumulate inside impact printers. This is normal. Paper dust and ink build-up must be periodically removed to avoid degraded print quality. Most paper dust accumulates around the ends of the platen and ribbon path.

To clean the interior of the printer, refer to Figure 46 and perform the following steps.

1.   Power off the printer power and unplug the printer power cord.

2.   Open the printer cover. Fully raise the forms thickness lever. Unload paper. Refer to the *Operator's Guide.*

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3. Unlatch both ribbon spools and carefully lift them off the hubs. Raise the ribbon out of the ribbon path.

4. Using a soft-bristled, non-metallic brush (such as a toothbrush), brush paper dust and ribbon lint off the tractors, shuttle cover assembly, base casting, and ribbon guides. Vacuum up the residue.

CAUTION   **Vacuum carefully around the hammer bank and surrounding area to avoid damage.**

5. Wipe the splined shaft with a soft cloth.

6. Check the ribbon mask and hammer bank cover for bits of torn paper or ribbon lint.

CAUTION   **To avoid corrosion damage, use only alcohol when cleaning printer mechanical elements. Solutions used to clean mechanical elements must contain no water.**

7. Using a soft cloth lightly moistened with anhydrous alcohol, remove dust and ink from the platen. The platen is the thick silver bar behind the hammer bank cover that rotates when the forms thickness lever is rotated. Clean the ribbon guides.

8. Brush and vacuum up dust or residue that has accumulated inside the lower cabinet.

9. Wipe the lower cabinet interior with a clean, lint-free cloth dampened (not wet) with water and mild detergent, or spray the surfaces lightly with window cleaning solution. Dry the lower cabinet interior by wiping it down with a clean, lint-free cloth.

10. Install the ribbon and load paper. Refer to the *Operator's Guide.*

Splined Shaft

Paper Support (2)

Tractor

Base Casting

Shuttle Cover
Assembly

Forms Thickness
Lever

Ribbon Guide
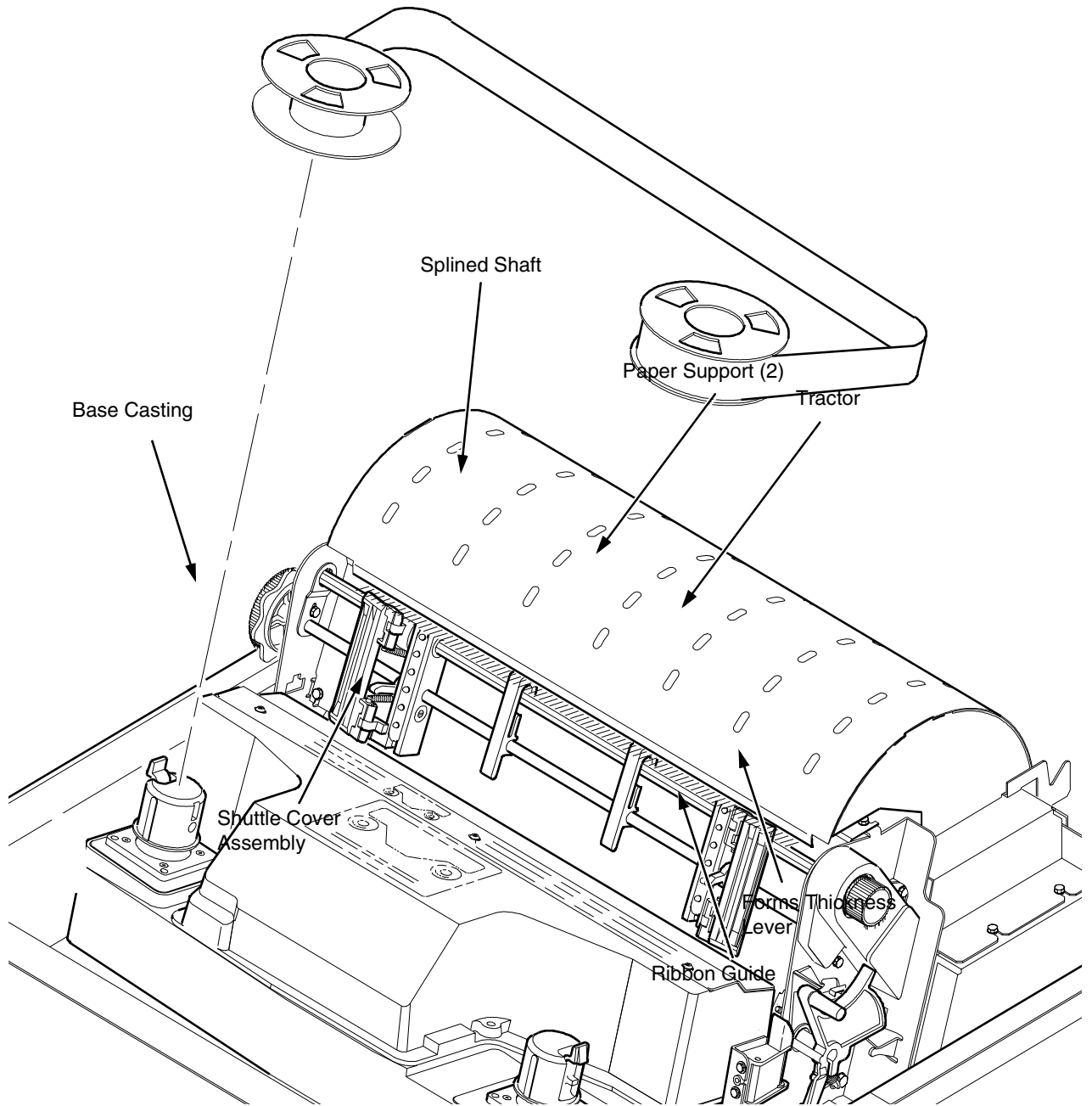
Figure 46. Cleaning the Interior of the Printer

Diagnosing Problems

This section is designed to help you recover from any problems which may arise with normal printer operation.

Printer Self-Tests

The printer self-tests are used to check the print quality and operation of your printer. An example procedure for running the self-test "All E's", which determines whether print quality is acceptable, is described in Table 17. A detailed description of all the printer self-tests is on page 114.

NOTE: Your authorized customer service engineer typically runs these tests to check printer operation.

Table 17. Sample Print Test (All E's)
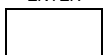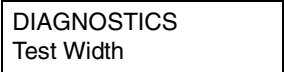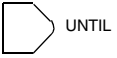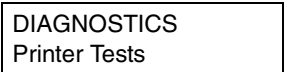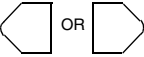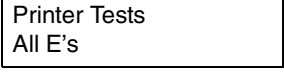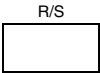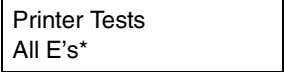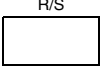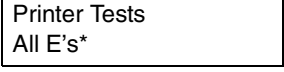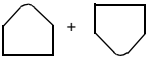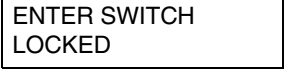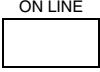
Step	Key	Result	Notes
1.	Install the ribbon. (See page 36.) Load full-width (136-column) computer paper. (See page 40.) Set top-of-form. (See page 45.)		
2.	ON LINE	OFFLINE CONFIG. CONTROL	The printer must be offline for testing.
3.	+	ENTER SWITCH UNLOCKED / OFFLINE CONFIG. CONTROL	Allows you to make configuration changes.
4.	UNTIL	OFFLINE DIAGNOSTICS	
5.		DIAGNOSTICS Printer Tests	
6.	UNTIL	DIAGNOSTICS Test Width	
7.		Test Width Full Width*	
8.	OR	Test Width X	Cycle through the choices. X = **Full Width** or **80 columns**.
9.	ENTER	Test Width X*	The width you have chosen will be used for the printer test.

Table 17. Sample Print Test (All E's) (continued)

Step	Key	Result	Notes
10.	△ UNTIL	DIAGNOSTICS Test Width	
11.	▷ UNTIL	DIAGNOSTICS Printer Tests	
12.	▽	Printer Tests Shift Recycle*	
13.	◁ OR ▷	Printer Tests All E's	
14.	R/S	Printer Tests All E's*	Starts the test.
15.	R/S	Printer Tests All E's*	Stops the test.
16.	△ + ▽	ENTER SWITCH LOCKED	Locks the ENTER key.
17.	ON LINE	ONLINE	
18.	Examine the print quality. The characters should be fully formed and of uniform density. If the test does not run or characters appear malformed, contact your authorized customer service engineer.		
19.	If the print quality is good, set the top-of-form. (See page 45.)		

Printing a Hex Dump
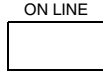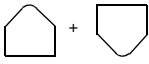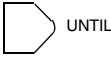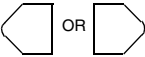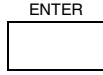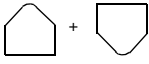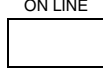
A hex code printout (or hex dump) is basically a translation of all host interface data to its hexadecimal equivalent. A hex dump lists all ASCII character data received from the host computer with their corresponding two-digit hexadecimal codes. Hex dumps are used to troubleshoot printer data reception problems.

Printable characters print as the assigned symbol; nonprintable characters are indicated by a period (.); and paper instructions (PI) are indicated by a "p". Table 18 shows the procedure for printing a hex dump.

```
 !"#$%&'()*+,-./   20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F
0123456789:;<=>?   30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F
@ABCDEFGHIJKLMNO   40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F
PQRSTUVWXYZ[\]^_   50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D 5E 5F
`abcdefghijklmno   60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F
pqrstuvwxyz{|}~    70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E 20
 !"#$%&'()*+,-./O  21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F 30
123456789:;<=>?@   31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F 40
ABCDEFGH..!"#$%&   41 42 43 44 45 46 47 48 0D 0A 21 22 23 24 25 26
'()*+,-./0123456   27 28 29 2A 2B 2C 2D 2E 2F 30 31 32 33 34 35 36
789:;<=>?@ABCDEF   37 38 39 3A 3B 3C 3D 3E 3F 40 41 42 43 44 45 46
GHIJKLMNOPQRSTUV   47 48 49 4A 4B 4C 4D 4E 4F 50 51 52 53 54 55 56
WXYZ[\]^_`abcdef   57 58 59 5A 5B 5C 5D 5E 5F 60 61 62 63 64 65 66
ghijklmnopqrstuv   67 68 69 6A 6B 6C 6D 6E 6F 70 71 72 73 74 75 76
wxyz{|}~ !"#$%&'   77 78 79 7A 7B 7C 7D 7E 20 21 22 23 24 25 26 27
()*+,-./01234567   28 29 2A 2B 2C 2D 2E 2F 30 31 32 33 34 35 36 37
89:;<=>?@ABCDEFG   38 39 3A 3B 3C 3D 3E 3F 40 41 42 43 44 45 46 47
HI..."#$%&'()*+,-  48 49 0D 0A 22 23 24 25 26 27 28 29 2A 2B 2C 2D
./0123456789:;<=   2E 2F 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D
>?@ABCDEFGHIJKLM   3E 3F 40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D
NOPQRSTUVWXYZ[\]   4E 4F 50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D
^_`abcdefghijklm   5E 5F 60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D
nopqrstuvwxyz{|}   6E 6F 70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D
~ !"#$%&'()*+,-.   7E 20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E
/0123456789:;<=>   2F 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E
?@ABCDEFGHIJ..#$   3F 40 41 42 43 44 45 46 47 48 49 4A 0D 0A 23 24
%&'()*+,-./01234   25 26 27 28 29 2A 2B 2C 2D 2E 2F 30 31 32 33 34
56789:;<=>?@ABCD   35 36 37 38 39 3A 3B 3C 3D 3E 3F 40 41 42 43 44
EFGHIJKLMNOPQRST   45 46 47 48 49 4A 4B 4C 4D 4E 4F 50 51 52 53 54
UVWXYZ[\]^_`abcd   55 56 57 58 59 5A 5B 5C 5D 5E 5F 60 61 62 63 64
efghijklmnopqrst   65 66 67 68 69 6A 6B 6C 6D 6E 6F 70 71 72 73 74
uvwxyz{|}~ !"#$%   75 76 77 78 79 7A 7B 7C 7D 7E 20 21 22 23 24 25
&'()*+,-./012345   26 27 28 29 2A 2B 2C 2D 2E 2F 30 31 32 33 34 35
6789:;<=>?@ABCDE   36 37 38 39 3A 3B 3C 3D 3E 3F 40 41 42 43 44 45
FGHIJK..$%&'()*+   46 47 48 49 4A 4B 0D 0A 24 25 26 27 28 29 2A 2B
,-./0123456789:;  2C 2D 2E 2F 30 31 32 33 34 35 36 37 38 39 3A 3B
<=>?@ABCDEFGHIJK   3C 3D 3E 3F 40 41 42 43 44 45 46 47 48 49 4A 4B
LMNOPQRSTUVWXYZ[   4C 4D 4E 4F 50 51 52 53 54 55 56 57 58 59 5A 5B
\]^_`abcdefghijk   5C 5D 5E 5F 60 61 62 63 64 65 66 67 68 69 6A 6B
lmnopqrstuvwxyz{   6C 6D 6E 6F 70 71 72 73 74 75 76 77 78 79 7A 7B
|}~ !"#$%&'()*+,  7C 7D 7E 20 21 22 23 24 25 26 27 28 29 2A 2B 2C
```

Figure 47. Hex Dump Sample

Table 18. Printing a Hex Dump

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.	ON LINE	OFFLINE CONFIG. CONTROL	The printer must be offline for testing.
3.	+	ENTER SWITCH UNLOCKED OFFLINE CONFIG. CONTROL	Allows you to make configuration changes.
4.	UNTIL	OFFLINE MAINT / MISC	
5.		MAINT / MISC Hex Dump Mode	
7.		Hex Dump Mode Disable*	
8.	OR	Hex Dump Mode Enable	Cycle through the choices.
9.	ENTER	Hex Dump Mode Enable*	An asterisk (*) indicates this choice is active.
16.	+	ENTER SWITCH LOCKED	Locks the ENTER key.
17.	ON LINE	ONLINE	
18.	Go to the host computer and send a file. The printer outputs a hex dump. Refer to the ASCII chart in Appendix B.		
19.	When the hex dump is complete, change the Hex Dump Mode back to Disable by following the steps outlined above and selecting Disable.		

Fault Messages

If a fault condition occurs in the printer, the status indicator on the control panel flashes on and off and the message display indicates the specific fault. Fault messages are summarized in Table 19.

Displayed faults fall into one of two categories:

*   Operator correctable

*   Field service required

For the operator correctable faults, follow the suggested corrective action in the fault message description. After correcting the displayed fault, press the CLEAR key to clear the error message and status indicator and resume printing. If the fault message reappears, contact your authorized customer service engineer.

NOTE: The *Maintenance Manual* provides more detailed information and procedures for resolving fault conditions. However, many of the procedures described there must be performed only by your authorized customer service engineer.

Fault Messages Requiring Field Service Attention

If a fault is not correctable by the operator, the fault message is followed by an asterisk (*). This usually indicates that an authorized customer service engineer is needed. You may try two steps to clear the fault before you call your authorized customer service engineer:

1.   Set the printer power switch to O (off), wait 15 seconds, then turn the printer on again. Run your print job again. If the message does not appear, it was a false indication and no further attention is required.

2.   If the message reappears, press the CLEAR key. If the message goes away, it was a false indication and no further attention is required. If the message reappears, call your authorized customer service engineer.

Table 19. LCD Message Troubleshooting Table

Displayed Message	Can User Correct?	Explanation	Solution
8.5V PWR FAIL*	No	Internal power failure.	Contact your authorized customer service engineer.[1]
15V PWR FAIL*	No	Controller voltage failure.	Contact your authorized customer service engineer.[1]
23.5V PWR FAIL*	No	Controller voltage failure.	Contact your authorized customer service engineer.[1]
48V PWR FAIL*	No	Internal power failure.	Contact your authorized customer service engineer.[1]
ACCESS NULL PTR*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
A TO D OVERRUN*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
BUFFER OVERFLOW	Yes	Host sends data after the printer buffer is full. (Serial interface.)	Check your serial host interface parameter settings; if necessary, adjust them so that they match the settings of the attached host.
CLEAR PAPER JAM	Yes	No paper motion.	Clear jam and reload paper. (See *Operator's Guide*.) If this message recurs, contact your authorized customer service engineer.[1]
CLOSE PLATEN	Yes	The forms thickness lever is open.	Close the forms thickness lever (page 47.)
COIL HOT*	No	One or more hammer coils are overheating.	Contact your authorized customer service engineer.[1]
CTL VOLT FAIL*	No	Controller voltage failure.	Contact your authorized customer service engineer.[1]
DRVR CIR BAD*	No	Hammer coil count test failed.	Contact your authorized customer service engineer.[1]

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Table 19. LCD Message Troubleshooting Table (continued)

Displayed Message	Can User Correct?	Explanation	Solution
EXHAUST FAN FLT	Yes	Sensors cannot detect current in fan circuit.	Power off the printer and remove the paper path. Check that the fan cable connector is connected. Check for obstruction of vents and fan airway, and remove any obstructions. Check for items beneath the printer blocking cabinet vents. Power back on the printer. If this message recurs, contact your authorized customer service engineer.[1]
FIRMWARE ERROR*	No	Application software tried to perform an illegal printer function or damaged memory detected on board.	Contact your authorized customer service engineer.[1]
FRAMING ERROR	Yes	Serial framing error. (Serial interface.)	Check your serial host interface parameter settings; if necessary, adjust them so that they match the settings of the attached host.
HAM. COIL OPEN*	No	Electrical malfunction of one or more hammer coils.	Contact your authorized customer service engineer.[1]
HB NOT INSTALLD*	No	Self-test does not detect hammer coils.	Contact your authorized customer service engineer.[1]
HMR BANK FAN FLT	Yes	Sensors cannot detect current in fan circuit.	Power off printer and remove paper path. Check that fan cable is connected. Check for obstruction of vents and fan airway; remove any obstructions. Check for items beneath the printer blocking cabinet vents. Power back on the printer. If this message recurs, contact your authorized customer service engineer.[1]
ILL EXT BUS ACC*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
ILLGL OPR ACCSS*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]

Table 19. LCD Message Troubleshooting Table (continued)

Displayed Message	Can User Correct?	Explanation	Solution
ILL INST ACCSS*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
INTAKE FAN FAULT	Yes	Sensors cannot detect current in fan circuit.	See description for HMR BANK FAN FLT.
LO DRV. SHORT *	No	Circuit(s) on the hammer bank or in the hammer bank power cable shorted to ground.	Contact your authorized customer service engineer.[1]
LOAD PAPER	Yes	Printer is out of paper.	Load paper.
PAP BAD TABLE*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PAP BSY TOO LNG*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PAP FIFO OVERFL*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PAP FIFO UNDRFL*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PAP ILLGL ST*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PAP INCMPL ENER*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PAP INVLD CMD*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PAP INVLD PARM*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PAP NOT SCHED*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PAP NT AT SPEED*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PAP UNEXP INT*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PARITY ERROR	Yes	Parity error (serial interface)	Check your serial host interface parameter settings; if necessary, adjust them so that they match the settings of the attached host.

Table 19. LCD Message Troubleshooting Table (continued)

Displayed Message	Can User Correct?	Explanation	Solution
PLAT INV CMD*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PLAT INV PARM*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PLAT INV STATE*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
POWER SAVER MODE	N/A	Status message: printer is in low-energy idle state, all fans and higher voltages are off, only +5Vdc logic circuits are active.	No action required.
POWER SUPPLY HOT*	No	Circuits are overheating on the power supply board.	Contact your authorized customer service engineer.[1]
PRINTER HOT*	No	Controller board sensors report high temperatures on the board.	Contact your authorized customer service engineer.[1]
PROTECTED INSTR*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
PWR SUPP VOLT *	No	Power supply failed.	Replace power supply board.
RIBBON INK OUT CHANGE RIBBON	Yes	The RibbonMinder program is warning that the amount of ink in the ribbon has reached 0%.	Replace ribbon or press CLEAR for two additional minutes of printing before the fault displays again. See "RibbonMinder" chapter.
RIB INVLD CMD*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
RIB INVLD STATE*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
RIBBON DRIVE*	No	CMX controller does not detect ribbon drive motor.	Contact your authorized customer service engineer.[1]
SECURITY VIOLATION*	No	Security code of PAL on controller board does not match code of firmware on the controller board.	Contact your authorized customer service engineer.[1]

Table 19. LCD Message Troubleshooting Table (continued)

Displayed Message	Can User Correct?	Explanation	Solution
SHUTL INV CMD*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
SHUTL INV PARM*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
SHUTTLE JAM	Yes	No shuttle movement or shuttle moving at wrong speed.	Check for obstruction to shuttle, a twisted ribbon, or forms thickness lever closed too tightly. If fault source is not apparent, contact your authorized customer service engineer.
SOFTWARE ERROR * Cycle power	No	Application software tried to perform illegal printer function, or damaged logic circuits found on controller board.	Contact your authorized customer service engineer.[1]
STACK OVERFLOW*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
STACK UNDERFLOW*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
TCB CORRUPTED*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
UNDEF INTERRUPT*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
UNDFNED OPCODE*	No	Fatal firmware error on controller board.	Contact your authorized customer service engineer.[1]
UP DRV. SHORT *	No	Hammer driver circuits on the boards shorted to ground.	Contact your authorized customer service engineer.[1]
HAMMER COIL BAD X, X, X,...	Yes	Coil # failed current test at power-up.	Record message, clear to continue printing, and contact your authorized customer service represetative.

[1] Before contacting an authorized customer service engineer, power off the printer, wait 15 seconds, then power it back on and rerun your print job. If the message reappears, press CLEAR. If the fault message still displays, then contact your authorized customer service engineer.

7 *RibbonMinder*

Overview

RibbonMinder is a user-definable software feature that determines when a ribbon should be changed. It does this by monitoring printer ribbon usage and alerts you when the print quality may fall below a level that you designate. This is especially important if you are printing bar codes to be scanned. This chapter explains how RibbonMinder works and how to configure it to meet your specific print job requirements.

Like the fuel gauge in your car, RibbonMinder indicates how much usable ink remains in the ribbon. The "gauge" for RibbonMinder is the message display on the control panel. The following message is typical for a new ribbon (100% full):

```
ENABLE STATE
RIBBON LIFE 100%
```

```
ON LINE    100%
<printer emulation>
```

As printing continues, the percentage of usable ink in the ribbon decreases (percentage ranges from 100% to -99%):

```
ON LINE    74%
<printer emulation>
```
Ribbon ink being consumed

```
ON LINE    8%
<printer emulation>
```
Ribbon life approaching end

When 0% usable ink appears, the printer is typically configured to stop printing and display the following message:

```
RIBBON INK OUT
CHANGE RIBBON
```

Continue with the following sections for configuring RibbonMinder options.

Using the RibbonMinder

This chapter outlines how to configure the RibbonMinder each time you change your ribbon, as well as how to set the options available with the RibbonMinder feature.

Configuration

This section explains how to unlock the ENTER key, find the RibbonMinder options, make changes, exit the configuration menu, and lock the ENTER key.

Following this section are procedures for changing each RibbonMinder option. To avoid repetition, references are made to Table 20 for entering the configuration menu.

NOTE: All RibbonMinder options are automatically saved in NVRAM when selected.

As you perform the following steps, refer to the RibbonMinder menu diagram shown in Figure 48.

* = Factory Default
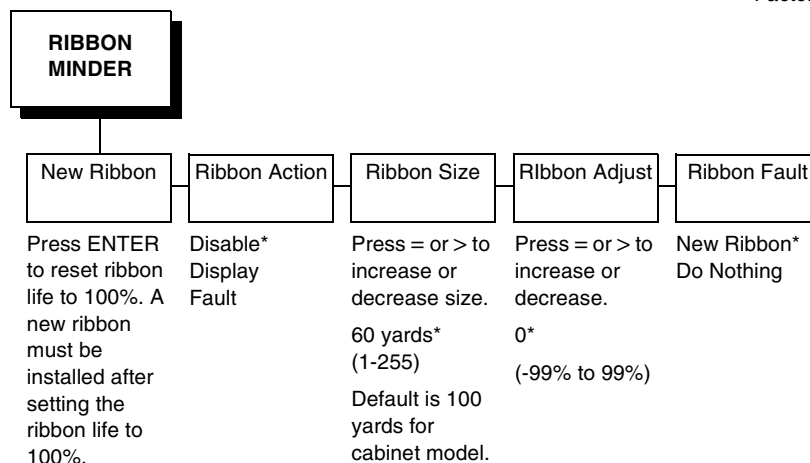
Figure 48. RibbonMinder Menu Diagram

Table 20. RibbonMinder Configuration

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.	ON LINE	OFFLINE CONFIG. CONTROL	
3.	△ + ▽	ENTER SWITCH UNLOCKED OFFLINE CONFIG. CONTROL	Allows you to make configuration changes.
4.	▷ UNTIL	OFFLINE RIBBONMINDER	
5.	▽	RIBBONMINDER New Ribbon XXX%	
6.	◁ OR ▷	RIBBONMINDER Ribbon Size	Scroll through to find Ribbon Action, Ribbon Size, Ribbon Adjust, Fault Action.
7.	▽	Ribbon Size 60 Yards*	Press when you reach the desired option (i.e. Ribbon Size).
8.	◁ OR ▷	Ribbon Size 61 Yards	Allows you to adjust the desired option.
9.	ENTER	Ribbon Size 61 Yards*	An asterisk (*) denotes the active selection.
10.	△ UNTIL	OFFLINE RIBBONMINDER	Exits the menu.
11.	△ + ▽	ENTER SWITCH LOCKED	Locks the ENTER key.
12.	ON LINE	ONLINE XXX% <printer emulation>	The printer is ready for normal operation.
13.	Close the printer cover. You can resume printing.		

Running a Job

Once you have set up options for RibbonMinder, it works without attention. When you begin printing with RibbonMinder enabled, the message display shows a ribbon life value of 100%. The ribbon life decreases as the ink is consumed.

New Ribbon

The New Ribbon option allows you to reset the ribbon life when you replace a worn ribbon. It may be necessary to replace ribbons before the ink has been depleted (e.g. when the ribbon has been snagged, folded, or otherwise damaged).

Table 21. New Ribbon Procedure

Step	Key	Result	Notes
1.	Replace ribbon. See your *Operator's Guide*.		
2.	Perform steps 2 through 5 from Table 20.	RIBBONMINDER New Ribbon XXX%	
3.	ENTER	RIBBONMINDER New Ribbon 100%	Resets ribbon life to 100%.
4.	CLEAR	OFFLINE CONFIG. CONTROL	
5.	△ + ▽	ENTER SWITCH LOCKED OFFLINE CONFIG. CONTROL	If the new ribbon is a different size, see Table 23. Otherwise, press UP and DOWN to lock the ENTER key.
6.	ON LINE	ONLINE 100% <printer emulation>	The printer is ready for normal operation.
7.	Close the printer cover. You can resume printing.		

Ribbon Action

The Ribbon Action option allows you to perform three functions: activate the RibbonMinder ink consumption display, disable the ink consumption display, and flash a fault message when the display reaches 0%.

Table 22. Ribbon Action Configuration

Step	Key	Result	Notes
1.	Perform steps 1 through 5 from Table 20.	RIBBONMINDER New Ribbon XXX%	
2.	UNTIL	RIBBONMINDER Ribbon Action	
3.		Ribbon Action Disable*	
4.	UNTIL	Ribbon Action Display	
5.	ENTER	Ribbon Action Display*	Activates the RibbonMinder display. When done, go to step 12.
6.	To disable the display, perform steps 1 through 5, then:		
7.	UNTIL	Ribbon Action Disable	
8.	ENTER	Ribbon Action Disable*	Disables the RibbonMinder display. When done, go to step 12.
9.	To activate the Fault option:		
10.	UNTIL	Ribbon Action Fault	Will flash a fault message when display reaches 0%.
11.	ENTER	Ribbon Action Fault*	Enables the Fault option.
12.	+	ENTER SWITCH LOCKED	Locks the ENTER key.
13.	ON LINE	ONLINE XXX% <printer emulation>	The printer is ready for normal operation.
14.	Close the printer cover. You can resume printing.		

RibbonMinder Fault

By pressing the CLEAR key, you clear the fault which will allow the printer to continue printing for an additional two minutes. This allows you to complete a nearly finished print job before changing the ribbon.

After the two-minute period has elapsed, the fault will reoccur if the Ribbon Action remains set on FAULT (page 153). If the Ribbon Action is changed to DISABLE or DISPLAY within the two-minute period, the fault will not reoccur.

If you do not want to change the ribbon at this time, you may disable RibbonMinder. If the ribbon is worn, the "Change Ribbon" message will reappear once the function is enabled again, and the printer status indicators will flash until the ribbon is changed.
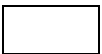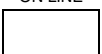
If the message display indicates the need to install a new ribbon and your print job is one page short of completion, press CLEAR and then ON LINE to print the last page. Otherwise, you may continue your print job at the end of this procedure. The fault will occur again two minutes after clearing the fault.

NOTE: If the fault message appears on the control panel and the ribbon is changed, the display will automatically reset to 100%. This feature may be disabled through the Fault Action menu.

Ribbon Size

When replacing a ribbon, if the new ribbon is a different size than the previous one, you must change the Ribbon Size option.

Table 23. Ribbon Size Configuration

Step	Key	Result	Notes
1.	Perform steps 1 through 5 from Table 20.		
2.	UNTIL	RIBBONMINDER Ribbon Size	
3.		Ribbon Size 60 Yards*	Allows you to make configuration changes.
4.	OR	Ribbon Size 100 Yards	
5.	ENTER	Ribbon Size 100 Yards*	Sets the new size.
6.	+	ENTER SWITCH LOCKED	Locks the ENTER key.
7.	ON LINE	ONLINE XXX% <printer emulation>	The printer is ready for normal operation.
8.	Close the printer cover. You can resume printing.		

Ribbon Adjust

You can adjust RibbonMinder to allow the printing of more or less pages before the display reaches 0%. The adjustment is a percentage of the default (0%) and ranges from -99% to 99%. For example, if the printer ordinarily printed 1000 pages at the default setting (0%), by setting the adjustment to 10% it would print 1100 pages (1000 + 10%) before the display reached 0%. Likewise, if the adjustment was set to -20%, it would print 800 pages (1000 - 20%) before the display reached 0%.

Pressing the NEXT key increases the percentage, while pressing the PREV key decreases the percentage.

Fault Action

When set to New Ribbon (the default) opening the platen while in RIBBON INK OUT / CHANGE RIBBON fault will reset the ribbon life to 100%, just as if the New Ribbon menu option was executed.

When set to Do Nothing, the ribbon life may only be reset through the New Ribbon menu option.

A Printer Specifications

Ribbon Specifications

NOTE: Only cabinet models support 100-yard ribbons. Pedestal models must use 60-yard ribbons. Use only the ribbons listed below. Each kit contains six ribbons.

Table 24. Printer Ribbons

Part Number	Description
107675-905	Carton of 6 OCR Application ribbons, used on both cabinet and pedestal models. Length: 60 yards (54.84 m) Width: 1 inch (2.54 cm) Thickness: .0039 inches (.009906 cm)
107675-908	Carton of 6 OCR Application ribbons, used on cabinet models only. Length: 100 yards (91.4 m) Width: 1 inch (2.54 cm) Thickness: .0039 inches (.009906 cm)

Paper Specifications

Paper

Type: Edge-perforated, fan-fold, 3 to 17 inches (7.62 to 43.18 cm) wide, 2 to 16 inches (5.08 to 40.64 cm) long.

Thickness: Single-part: 15 to 100 pound (6.80 to 45.36 kg) stock; Multi-part: 1- to 6-part forms (maximum 12 lb [5.44 kg] ply of upper plies)

Sheet Thickness:0.025 inch (0.064 cm) maximum

Drive: Adjustable tractors (6-pin engagement)

Labels

On Backing:One-part continuous perforated fanfold back form. Labels must be placed at least 1/6 inch (0.42 cm) from the fan-fold perforation. Backing adhesive must not be squeezed out during printing.

Sheet Size: 3 to 17 inches (7.62 to 43.18 cm) wide, including the two standard perforated tractor feed strips. A maximum sheet length of 16 inches (40.64 cm) between top and bottom perforations.

Thickness: Not to exceed 0.025 inch (0.064 cm) (including backing sheet)

Printer Dimensions

Cabinet Model

Height: 42.5 inches (108 cm)

Width: 27 inches (68.6 cm)

Depth: 29 inches (73.7 cm)

Weight: 225 lbs. (102.1 kg) unpackaged
            285 lbs. (129.3 kg) packaged

Pedestal Model

Height: 35 inches (88.9 cm)

Width: 24.6 inches (62.5 cm)

Depth: 20.7 inches (52.6 cm)

Weight: 105 lbs. (47.6 kg) unpackaged
            115 lbs. (52.2 kg) packaged

Environmental Characteristics

Temperature

Operating   41° to 104° F (5° to 40° C) up to 5000 feet (1524 meters)
            41° to 90° F (5° to 32° C) up to 8000 feet (2438 meters)

Storage   -40° to 158° F (- 40° to 70° C)

Relative Humidity

Operating   15% to 80% (noncondensing)

Storage   15% to 90% (noncondensing)

Energy Star

Printronix DEC LG Emulation printers comply with the requirements of the Energy Star Office Equipment Program of the U.S. Environmental Protection Agency.

When in the reduced-power idle state, the printer displays "Power Saver Mode."

Electrical Characteristics

Input Voltage

Line Voltage Design Range	Line Frequency	RMS Current 500 LPM	RMS Current 1000 LPM	RMS Current 1500 LPM
88-135 V RMS	47-63 Hz	6A @ 100 V	6A @ 100 V	8A @ 100 V
178-270 V RMS	47-63 Hz	3A @ 200 V	3A @ 200 V	5A @ 200 V

Power Consumption

Operating Mode	Units	Power Consumption		
		500 LPM	1000 LPM	1500 LPM
Standby[1]	Watts	30 (60)	30 (60)	45 (80)
	BTU/Hour	100 (205)	100 (205)	154 (273)
Nominal[2]	Watts	180	220	310
	BTU/Hour	615	750	1058
Maximum[3]	Watts	270	315	440
	BTU/Hour	920	1075	1500

[1]Numbers represent consumption in Power Saver Mode.
Numbers in parenthesis represent standby mode.
[2]Nominal power measured at 120 VAC while printing ASCII Shift-Recycle.
[3]Maximum power measured at 120 VAC while printing Black Plot.

Interfaces

Type: IEEE 1284 Parallel, Centronics Parallel, RS-232/RS-422 Serial, Dataproducts Parallel

Logic Levels:TTL/EIA-232E/EIA-422B

Data Format:ASCII

Compatibility:IEEE 1284 Parallel, Dataproducts Parallel, Centronics Parallel, EIA-232E, and EIA-422B.

Transfer Rates:Up to 200 Kilobytes on parallel interface
Up to 115K baud on RS-232/RS-422 serial interface

Printing Rates

The printing speed of text is measured in lines per minute (lpm), and is a function of the selected font and the vertical dot density. Printing speed is independent of the number of characters configured in the character set repertoire. Print rates for lines containing attributes such as bold or emphasized printing, superscripts, subscripts, or elongated attributes will decrease to not less than half the rates of the font without such attributes. The exact print rate of lines containing these attributes depends on the specific print job, but software maximizes the throughput by dynamically determining which dot rows contain adjacent dots and must be printed in two strokes.

The reverse paper feed capability allows the printing of multiple densities on a single line. This is useful in printing forms and text together or in mixing different fonts on a print line. Use of multiple densities and reverse paper feed also affects throughput.

B *Standard ASCII Character Set*

KEY

BITS B7 B6 B5	0 0 1	
B4 B3 B2 B1		33 ← OCTAL
1 0 1 1	**ESC**	27 ← DECIMAL
		1B ← HEX

← ASCII CHARACTER

B7 B6 B5 BITS / B4 B3 B2 B1 ROW	COLUMN	0 0 0 — 0	0 0 1 — 1	0 1 0 — 2	0 1 1 — 3	1 0 0 — 4	1 0 1 — 5	1 1 0 — 6	1 1 1 — 7
0 0 0 0	0	NUL 0/0/0	DLE 20/16/10	SP 40/32/20	0 60/48/30	@ 100/64/40	P 120/80/50	` 140/96/60	p 160/112/70
0 0 0 1	1	SOH 1/1/1	DC1 (XON) 21/17/11	! 41/33/21	1 61/49/31	A 101/65/41	Q 121/81/51	a 141/97/61	q 161/113/71
0 0 1 0	2	STX 2/2/2	DC2 22/18/12	" 42/34/22	2 62/50/32	B 102/66/42	R 122/82/52	b 142/98/62	r 162/114/72
0 0 1 1	3	ETX 3/3/3	DC3 (XOFF) 23/19/13	# 43/35/23	3 63/51/33	C 103/67/43	S 123/83/53	c 143/99/63	s 163/115/73
0 1 0 0	4	EOT 4/4/4	DC4 24/20/14	$ 44/36/24	4 64/52/34	D 104/68/44	T 124/84/54	d 144/100/64	t 164/116/74
0 1 0 1	5	ENQ 5/5/5	NAK 25/21/15	% 45/37/25	5 65/53/35	E 105/69/45	U 125/85/55	e 145/101/65	u 165/117/75
0 1 1 0	6	ACK 6/6/6	SYN 26/22/16	& 46/38/26	6 66/54/36	F 106/70/46	V 126/86/56	f 146/102/66	v 166/118/76
0 1 1 1	7	BEL 7/7/7	ETB 27/23/17	' 47/39/27	7 67/55/37	G 107/71/47	W 127/87/57	g 147/103/67	w 167/119/77
1 0 0 0	8	BS 10/8/8	CAN 30/24/18	(50/40/28	8 70/56/38	H 110/72/48	X 130/88/58	h 150/104/68	x 170/120/78
1 0 0 1	9	HT 11/9/9	EM 31/25/19	) 51/41/29	9 71/57/39	I 111/73/49	Y 131/89/59	i 151/105/69	y 171/121/79
1 0 1 0	10	LF 12/10/0A	SUB 32/26/1A	* 52/42/2A	: 72/58/3A	J 112/74/4A	Z 132/90/5A	j 152/106/6A	z 172/122/7A
1 0 1 1	11	VT 13/11/0B	ESC 33/27/1B	+ 53/43/2B	; 73/59/3B	K 113/75/4B	[133/91/5B	k 153/107/6B	{ 173/123/7B
1 1 0 0	12	FF 14/12/0C	FS 34/28/1C	, 54/44/2C	< 74/60/3C	L 114/76/4C	\ 134/92/5C	l 154/108/6C	| 174/124/7C
1 1 0 1	13	CR 15/13/0D	GS 35/29/1D	- 55/45/2D	= 75/61/3D	M 115/77/4D	] 135/93/5D	m 155/109/6D	} 175/125/7D
1 1 1 0	14	SO 16/14/0E	RS 36/30/1E	. 56/46/2E	> 76/62/3E	N 116/78/4E	^ 136/94/5E	n 156/110/6E	~ 176/126/7E
1 1 1 1	15	SI 17/15/0F	US 37/31/1F	/ 57/47/2F	? 77/63/3F	O 117/79/4F	_ 137/95/5F	o 157/111/6F	DEL 177/127/7F

C   *Printronix Technical Support*

Sources of Support

There are several sources of help and information available depending on the type of help you need:

- Your Printronix Vendor
- Your Application Vendor
- Internet
- Printronix Technical Support

Your Printronix Vendor

Your local Printronix vendor from whom you purchased this printer may be best equipped to help you. Your vendor has specially trained service technicians available to answer questions and the equipment to analyze your printer problems.

Your Application Vendor

Often, "printing" problems have more to do with the application being used than with the printer. In this case, the application manufacturer is the best source of help.

Internet

The Printronix website provides access to technical reports, new product announcements, and other general information about Printronix. You can access the Printronix website via any one of the many world-wide web browsers available to Internet users. The Printronix home page is at http://www.printronix.com.

For printer specific information (e.g., printer products, software and drivers, accessories, supplies, etc.) go to the following website: www.digital.com/printers.

Printronix Technical Support

Printronix Technical Support is available world-wide. When calling Printronix for assistance, please have the following information readily available:

- Your phone number, fax number and shipping address.

- A description of the problem.

- The printer model.

- The type of host computer you are using.

- The type and version of operating system you are using.

- The application and version you are using.

- The interface you are using (e.g., network using a RP500, parallel, serial).

- If using the network interface, the network protocol (TCP/IP, EtherTalk, LAT, IPX).

- The printer emulation you are using (e.g., Digital LG, LP+ [Proprinter XL, Epson FX, P-series], VGL or PGL).

- Your printer's configurations listed on the LG Configuration Summary page. To print out this page, refer to Chapter 6 of this manual.

- If you have a printer hardware problem you cannot resolve, provide the error message displayed on the Control Panel. For a list of possible error messages, refer to Chapter 6 of this manual.

D *Glossary*

A

active column
: The horizontal location on the paper where the next character will print.

active line
: The vertical location on the paper where the next character will print.

active position
: The position on the paper where the next character will print. The intersection of the active column and the active line.

ASCII
: *Abbrev. for* American Standard Code for Information Interchange. A standard character encoding scheme introduced in 1963 and used widely on many computers and printers. It is a 7-bit code with 128 different bit patterns. There is no parity recommendation.

attributes, print
: Operations performed on text that alter its appearance but do not change the font. Examples: underlining, superscripting, bold, etc.

B

bar code
: A printed code consisting of parallel bars of varied width and spacing and designed to be read by a one-dimensional scanning device.

baud
: A unit of speed that measures the rate at which information is transferred. Baud rate is the reciprocal of the length in seconds of the shortest pulse used to carry data. For example, a system in which the shortest pulse is 1/1200 second operates at 1200 baud. On RS-232 serial lines, the baud rate equals the data flow rate in bits per second (bps). To communicate properly, a printer must be configured to operate at the same baud rate as its host computer.

bold
: A print attribute specifying text of a heavy line thickness. *See also* character weight.

buffer
: A reserved area in memory where data is written and read during data transfers.

bus
: A circuit for the transfer of data or electrical signals between two devices.

C

character cell
The invisible rectangular space occupied by a character, including the white space around the character. The height of a cell remains constant even with changes in the current line spacing, and the width is equal to the current character spacing. Used as a unit of spacing.

character proportion
The ratio of character height to character width. *See also* compressed and expanded.

character set
A set of codes, each of which represents a printable character, including symbols, punctuation, numbers, diacritical markings, and alphabet characters. Each character is assigned a unique code value.

character weight
The degree of lightness and thickness of printed text. For example: **"Bold" refers to a heavy or thick character weight.** "Medium," "normal," or "book weight" refer to the character weight used in this sentence.

checksum
A stored or transmitted numerical value used to verify data integrity.

command sequence
Two or more bytes that instruct the printer to perform a special function. The first character in the sequence is a special function control character (SFCC), which alerts the printer that the string is a command sequence. *See also* escape sequence, SSCC, *and* SFCC.

compatibility
The ability of one printer to accept and properly process commands meant for a different printer. *See also* emulation *and* protocol.

compressed
Refers to a typeface with a font width approximately 60% smaller than normal. Character height is not changed.

configuration
Refers to the operating properties that define how the printer responds to signals and commands received from the host computer at the printer interface. These properties are called configuration parameters and must be set to match the operating characteristics of the host computer system.

controller
An independent logic unit in a data processing system that controls data paths between the central processing unit and one or more units of peripheral equipment.

cpi
Abbrev. for characters per inch. A measurement of monospaced fonts indicating the horizontal character density. For example, 10 cpi means 10 characters can be printed in one horizontal inch. *See also* pitch.

cps
Abbrev. for characters per second. A measurement of the print speed of a serial (character) printer.

D

decipoint   One tenth of a point. A unit of length equal to 1/720 inch.
                   See also point.

default   A value, parameter, attribute, or option assigned by a
                   program or system if another is not specified by the user.

descender   The portion of a printed, lowercase character that
                   appears below the base line. For example, "g," "j," "p,"
                   "q," and "y" all are characters with lowercase descenders.

diagnostic   Pertains to the detection and isolation of printer
                   malfunctions or mistakes.

disable   To deactivate, make "false" (0), or set to OFF.

DP   *Abbrev. for* data processing font (see HS).

E

EIA/TIA   Electronics Industries Association.

Elite   A name indicating a monospaced font with a pitch of 12
                   cpi (and usually 10 points in height).

em   A unit of measure in typesetting: the width of a piece of
                   type about as wide as it is tall. (Derived from uppercase
                   M, usually the widest character in a set.)

emulation   Refers to the ability of a printer to execute the commands
                   of another printer language (protocol).
                   See also compatibility *and* protocol.

en   A unit of measure in typesetting equal to half the width of
                   an em.

enable   To activate, make "true" (1), or set to ON.

escape sequence   A command sequence in which the first byte is always
                   the ASCII ESC character.
                   See also command sequence, SSCC, *and* SFCC.

expanded   Refers to a typeface with a font width larger than normal.
                   Character height is not changed.

F

family (or type)   A set of all variations and sizes of a type style.

fixed-pitch fonts *See* font, monospaced.

font   The complete set of a given size of type, including
                   characters, symbols, figures, punctuation marks,
                   ligatures, signs, and accents. To fully describe a font, you
                   must specify seven characteristics:
                   1) typeface (Courier, Helvetica, Swiss, etc.)
                   2) spacing (proportional or monospaced)
                   3) type size (12 point, 14 point, etc.)

4) scale factor (character height/width ratio)
5) type style (Roman or italic)
6) character weight (bold, normal, etc.)
7) character proportion (normal, compressed, expanded).

font, landscape	A font printed parallel to the long edge of a page, or a font capable of being produced on a landscape page orientation.
font, monospaced	Also called fixed-pitch font and mono-font. Every character, regardless of horizontal size, occupies the same amount of font pattern space. All monospaced fonts use specific pitch size settings. Monospaced fonts are sometimes used when strict character alignment is desired (tables, charts, spreadsheets, etc.).
font name	*See* typeface.
font pattern	A font pattern is the matrix of pixels which represents a character, symbol, or image.
font, portrait	A font printed parallel to the short edge of a page.
font, proportional	A font in which the width of a character cell varies with the width of the character. For example, [i] takes less space to print than [m]. Using proportional fonts generally increases the readability of printed documents, giving text a typeset appearance.
font weight	The thickness of the lines making up a character. For example, "bold" and "light" are different font weights.
font width	The measurement of the width of a character cell in dots.

H

hex codes	Codes based on a numeral system with a radix of 16.
host computer	The computer that stores, processes, and sends data to be printed, and which communicates directly with the printer. The term "host" indicates the controlling computer, since modern printers are themselves microprocessor-controlled computer systems.
HS	*Abbrev. for* high speed font.
Hz	*Abbrev. for* Hertz. Cycles per second, a measure of frequency.

I

IEEE	Institute of Electrical and Electronic Engineers, Inc.
IGP	Intelligent Graphics Processor. An interface that converts graphics commands received from the host computer to binary plot data that is usable by the printer.
initialization	A series of processes and self-tests to set power-up default conditions and parameters.

interface	The hardware components used to link two devices by common physical interconnection, signal, and functional characteristics.
invoke	To put into effect or operation.
ipm	*Abbrev. for* inches per minute. A measurement of the speed of a printer printing in graphics print mode (plotting speed).
italic	A slanted type style. *This is an italic type style.*

L

landscape	Printed perpendicular to the paper motion.
LCD	*Abbrev. for* liquid-crystal display. The LCD is located on the control panel. Its purpose is to communicate information to the operator concerning the operating state of the printer.
LED	*Abbrev. for* light-emitting diode. The printer control panel has LEDs that indicate the status of the printer to the operator.
logical link	The parameters that specify data transfer, control, or communication operations.
lpi	*Abbrev. for* lines per inch. A measurement indicating the vertical spacing between successive lines of text. For example, 8 lpi means eight lines of text for every vertical inch.
lpm	*Abbrev. for* lines per minute. A measurement of the print speed of a line printer printing in text print mode.

M

monospaced	*See* font, monospaced.

N

NLQ	*Abbrev. for* near letter quality font.
nonvolatile memory	Nonvolatile memory stores variables that must be preserved when the printer is turned off, such as configuration parameters and printer usage statistics. Nonvolatile memory is preserved by means of an independent, battery-operated power supply. When printer power is turned off, the battery supplies the power needed to keep stored data active.
NVRAM	*Acronym for* nonvolatile random access memory. *See* nonvolatile memory.

O

OCR	*Abbrev. for* optical character recognition. A process by which a machine can "read" characters printed in a special standardized font. Data are read by a photoelectric optical scanner and can be recorded on magnetic tape or disk. OCR-A and OCR-B are two widely used OCR fonts.

P

parity (check)	Parity checking is the addition of non-data bits to data, resulting in the number of bits that are set to a "1" being either always even or always odd. Parity is used to detect data errors.
PCBA	*Abbrev. for* printed circuit board assembly.
pica	A name indicating a monospaced font with a pitch of 10 cpi (and usually 12 points in height). Pica is also used in typography as a unit of measurement equal to 1/6 inch.
pin configuration	Establishes the physical attachment and protocol conversion connections for the host interface.
pitch	The number of text characters printed per horizontal inch. Specified in characters per inch (cpi). *See also* cpi.
pixel	*Derived from* picture (PIX) ELement. The smallest displayable picture element on a video monitor or printable unit. In printing, a pixel is a dot.
point	A unit of length in printing and typography, used to specify type sizes, heights of font characters, etc. There are 72 points in a vertical inch; thus, one point equals 1/72 inch, or approximately 0.0139 inch. Some examples of point sizes are: This is 8 point type. This manual is printed in 10 point type. This is 14 point type.
port	A channel used for receiving data from or transmitting data to one or more external devices.
portrait	Printed parallel to the short edge of a page.
print mode	Font.
proportion, character	*See* character proportion.
proportional	*See* font, proportional.
protocol	A set of rules or conventions governing the exchange of information between computer systems, or between a printer and a host computer. For computer printers, a protocol is the coding convention used to convey and print data. A printer protocol includes codes for printing text and graphics, as well as codes instructing the printer to perform special operations, and machine-to-machine communication codes. *See also* compatibility and emulation.

R

RAM
Acronym for random-access memory. Also called "main memory" or "working memory." RAM is the active memory of a printer, into which programs are loaded. This memory can be read from or written to at any time. RAM is also termed "volatile" because whatever information is in RAM is lost when power is turned off or interrupted.
See also ROM.

read
To retrieve data from memory (RAM) or from mass storage (hard disk, floppy diskette, etc.).

reset
To turn off, deactivate, disable, or return to a previously determined state.

resolution
A measure expressing the number of component units in a given range used to create an image. In printing, this is expressed as the number of dots per inch (dpi) horizontally and vertically.

ROM
Acronym for read-only memory. Programs, instructions, and routines permanently stored in the printer. Information in ROM is not lost when power is turned off. ROM cannot be written to-hence the term "read-only."
See also RAM.

roman
A type style in which the characters are upright. This sentence is printed in a roman type style.

S

sans serif
A typeface or font in which the characters do not have serifs. This font is sans serif.

serial communications
The sequential transmission of data, in which each element is transferred in succession.

serial matrix
A type of printing technology used in some impact printers. Data are sent to the printer through either a serial or a parallel interface, but the print head must receive the data serially in order to form each character. The moving print head uses pins to form whole characters one at a time and one after the other. The pins print dots according to programmed matrix patterns. A line matrix printer also forms characters with dots in matrix patterns, but it feeds print data in parallel to many hammers mounted on a rapidly oscillating shuttle. The hammers fire simultaneously to print entire lines at a time.

serif	A short line stemming from and at an angle to the upper or lower end of the stroke of a letter or number character.

$$A \swarrow {}^{\text{serif}}$$
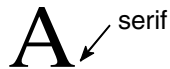
set	To turn on, activate, invoke, or enable.
SFCC	*Abbrev. for* special function control character. The first character in a printer command sequence. In P-Series emulation mode, you can select 0 though 7F as the SFCC. In Epson FX and Proprinter emulation mode, the SFCC must always be the ASCII ESC character. *See also* command sequence *and* escape sequence.
size, type	*See* point.
slewing	Rapid vertical paper movement.
spacing	*See* font, proportional *and* font, monospaced.
start bits	In serial data transfer, a signal indicating the beginning of a character or data element.
stop bits	In serial data transfer, a signal indicating the end of a character or data element.
string	Two or more bytes of data or code treated as a unit.
style, type	*See* type style.
symbol set	*See* character set.

T

type family	*See* typeface.
type size	*See* point.
type style	Refers to either the upright or italic character style in a specific font family. Roman is upright, *italic is slanted.*
typeface	A descriptive name or brand name that identifies a particular design of type. Examples are: Courier, Helvetica, and Swiss. Also called type family.
typographic font	*See* font, proportional.

V

VFU	*Abbrev. for* vertical format unit.

W

warm start	A reboot or soft reset. The following occurs: 1) data are cleared from all buffers (I/O and internal print buffers); 2) all internal system variables are reset to default values, which is transparent to the user; and 3) the power-up configuration values-except the host I/O selection-are loaded. If the user has not defined power-up configuration values, the printer resets to the factory default configuration values.
weight	*See* character weight.
write	To store data to memory (RAM) or to mass storage (hard disk, floppy diskette, etc.).

X

X-OFF	A character transmitted by the printer announcing that the printer is off-line or the buffer is almost full.
X-ON	A character transmitted by the printer announcing that the printer is on-line or the buffer is almost empty.

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